SELECTED COMMUNITY AND INSTITUTIONAL CHARACTERISTICS OF FLORIDA PUBLIC SCHOOLS RELATED TO TWELFTH GRADE TEST SCORES

By

RICHARD MARVIN MOORE

A DISSERTATION PRESENTED TO THE GRADUATE COUNCIL OF
THE UNIVERSITY OF FLORIDA
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF EDUCATION

UNIVERSITY OF FLORIDA
1968

ACKNOWLEDGMENTS

The writer wishes to express his appreciation to Dr. R. L. Johns, the chairman of his doctoral committee, for his help and guidance in formulating the approach to the study and for his advice and counsel in the preparation of the manuscript. The writer is particularly grateful to Dr. C. M. Bridges for advice regarding specific statistical techniques and research design.

Special thanks is extended to Dr. R. B. Kimbrough without whose assistance this study would not have been possible. The other members of the graduate committee, Dr. R. E. Albrecht, Dr. W. A. LaVire, and Dr. R. Perkins, have been most helpful with their suggestions and encouragement during the study.

Sincere thanks is extended to Mr. Earl Blekking for the countless hours he spent in assisting the writer in the preparation of data for use in the computer programs.

For invaluable assistance in typing, and editing, the writer sincerely thanks Mrs. Pat Snoemake.

To his wife, Leila, for her assistance in the preparation of this study, the writer wishes to express his heartfelt thanks.

TABLE OF CONTENTS

		Page
ACKNOWLEDGMENTS		ii
LIST OF TABLES		v
CHAPTER		
I.	INTRODUCTION	1
	Statement of the Problem	4
	Need for the Study	4
	Definition of Terms	7
	Delimitations	8
	Review of Related Research	9
	Organization of the Study	18
II.	PROCEDURES	19
	Selection of the Independent Variables	19
	Institutional Characteristics	20
	Community Characteristics	22
	Selection of Dependent Variables	23
	Treatment of the Data	24
III.	ANALYSES AND INTERPRETATION OF DATA	26
	Relationship of Independent Variables to English Scores	29
	Relationship of Independent Variables to Social Studies Scores	32
	Relationship of Independent Variables to Natural Science Scores	35
	Relationship of Independent Variables to Mathematics Scores	42
	Relationship of Independent Variables to Total Scores	45
	Relationship of Independent Variables to Aptitude Scores	48
	Relationship of Independent Variables to Dependent Variables Using Beta Coefficients	53

CHAPTER Page

IV. SUMMARY AND CONCLUSIONS..... 62

Purpose of the Study..... 62
Selection of Variables..... 62
Statistical Procedure..... 64
Conclusions..... 65
The Relationships of Independent Variables to English Scores on the TGTP..... 65
The Relationships of Independent Variables to Social Studies Scores on the TGTP..... 67
The Relationships of Independent Variables to Natural Science Scores on the TGTP..... 68
The Relationships of Independent Variables to Mathematics Scores on the TGTP..... 69
The Relationships of Independent Variables to Total Scores on the TGTP..... 71
The Relationships of Independent Variables to Aptitude Scores on the TGTP..... 72
Implications of the Study..... 73

BIBLIOGRAPHY..... 77

BIOGRAPHICAL SKETCH..... 81

LIST OF TABLES

TABLE		Page
1.	Comparison of the Percentage of Increase in the ADM and Revenue Receipts of Florida Public Schools, Grades K-12, by Years	6
2.	Zero Order Correlation Matrix, Independent and Dependent Variables	27
3.	State Mean and Standard Deviation, Independent Variables	28
4.	Institutional Correlates of English Scores on the TGTP	30
5.	Community Correlates of English Scores on the TGTP	31
6.	The Correlates of English Scores on the TGTP	33
7.	Institutional Correlates of Social Studies Scores on the TGTP	34
8.	Community Correlates of Social Studies Scores on the TGTP	36
9.	The Correlates of Social Studies Scores on the TGTP	37
10.	Institutional Correlates of Natural Science Scores on the TGTP	39
11.	Community Correlates of Natural Science Scores on the TGTP	40
12.	The Correlates of Natural Science Scores on the TGTP	41
13.	Institutional Correlates of Mathematics Scores on the TGTP	43
14.	Community Correlates of Mathematics Scores on the TGTP	44

TABLE Page

15. The Correlates of Mathematics Scores on the TGTP..... 46

16. Institutional Correlates of Total Score on the TGTP..... 47

17. Community Correlates of Total Score on the TGTP..... 49

18. The Correlates of Total Score on the TGTP..... 50

19. Institutional Correlates of Aptitude Score on the TGTP..... 51

20. Community Correlates of Aptitude Score on the TGTP..... 52

21. The Correlates of Aptitude Score on the TGTP..... 54

22. The Correlates of English Scores on the TGTP, Beta Coefficients..... 55

23. The Correlates of Social Studies Scores on the TGTP, Beta Coefficients..... 56

24. The Correlates of Natural Science Scores on the TGTP, Beta Coefficients..... 57

25. The Correlates of Mathematics Scores on the TGTP, Beta Coefficients..... 58

26. The Correlates of Total Scores on the TGTP, Beta Coefficients..... 59

27. The Correlates of Aptitude Scores on the TGTP, Beta Coefficients..... 60

CHAPTER I

INTRODUCTION

In the ten year period from 1950 to 1960 enrollment in the public schools of the United States increased from 25,111,000 to 36,087,000 pupils. Estimates of student enrollment by the year 1970 range from 45 to 48 million. The U. S. Office of Education figures for 1966 showed a student enrollment of 43,055,000 which appears to make the figure of 48 million by 1970 a bit conservative. Not only are there more pupils to educate, they are also staying in school for a longer period of years. The median years of schooling for persons 25 years of age or older was only 9.3 in 1950. By 1960 this figure had risen to 10.6 years (40). Our democratic ideal of educating each citizen to his maximum capability practically insures another rise in the level of schooling during this decade. This, and the increasing complexity and technological developments in our present culture, emphasizes the need for extending educational opportunity to all segments of the population. A high school education can no longer be considered a luxury. It is virtually an economic necessity.

In recent years the educational system has been under a heavy burden. This is especially true in the public secondary schools with the current pressure for equality of opportunity and the prevention of drop-outs. Improving the quality of education as measured by academic achievement, along with increasing the quantity of education, is a most difficult task, which will be further complicated with any

significant increase in retention of the less gifted academic students. The problem is further complicated by the fact that tax revenues from existing sources may not be adequate to cover the cost of future educational needs. This difference in needed revenues and resources may be reduced if careful attention is given to the effective utilization of those resources which are now and will be devoted to the educational process. This implies the need for exploring the input-output relationships of the system to determine the approach to the internal economics of education that provides the best possible combination of in-school variables and socioeconomic background of the students.

In economics, inputs are usually defined in terms of land, labor, and capital, or what is spent in time, money, and energy to create a product. The output of the economic system is the product itself, be it a loaf of bread or an airplane. In the case of the educational system, however, the output may be defined in terms of what knowledge or skill has been imparted to the student. The difficulty of assessing the value of such an output is apparent.

Burkhead recognized the significance of this problem when he wrote:

> The task of the school administrator is to ascertain how such increases in resources can be employed most effectively so that incremental additions per student yield substantial incremental increases in educational output. Five new guidance specialists will produce a better educational output than five new language teachers. Additional funds spent on materials and supplies will yield a better educational output than additional funds spent on new instruments for the high school band. In the literature of education this approach is usually called 'educational strategy.' In the literature

> of economics it is an efficiency consideration. In the years ahead this kind of educational strategy-efficiency consideration will be of central concern (4, p. 4).

What course of action does the educator follow if those factors having the greatest effect on student output are socioeconomic in nature? Such findings could force drastic revisions in the educational philosophy of a system. If changes must be affected in the socioeconomic area, parents, especially the younger ones, may need to return to school, perhaps even with their children. The emphasis might also shift from providing facts to students to providing jobs for parents. Federal and state-aid projects might be inaugurated to provide the type training that is not presently seen as the responsibility of the public schools.

The crux of the problem facing education may not lie in educational inputs in the form of student characteristics but in the allocation of those resources available to the administrator. If there is little an administrator can do to offset differences resulting from home or environmental influences, and if studies support the hypothesis that this segment of pupil inputs is responsible for the major portion of differences in student output as Coleman (6) and Burkhead (4) suggested, then the solution to the problem of upgrading quality in education may involve a reorientation of the school program so that it more nearly coincides with social needs. On the other hand, if effective utilization of educational resources produces a significant change in student output, capable administration could

be the key to improving the quality of education within the system. It is to this question of educational strategy and socioeconomic influences that this study is directed.

Statement of the Problem

The problem for this study is the examination of two categories of data as they relate to educational output of the public high schools in Florida. The first of these is a group of selected institutional characteristics and the second is a set of selected socioeconomic characteristics.

More specifically, this study proposes to answer the following questions:

1. Do various institutional characteristics such as student-faculty ratios, size of school centers, per cent of male faculty members, and fiscal variables relate to educational output as measured by scores on the Florida Statewide Twelfth Grade Testing Program?

2. Are selected socioeconomic status variables related to educational output as measured by standardized test results?

3. If relationships can be identified in Steps 1 and 2 above, what is the nature and strength of the relationship?

Need for the Study

Florida, among the fastest growing in population of the fifty states, will be faced with the enormous problems of how to cope with increases in student enrollment and rising costs in education. Table 1 points out the growth in student membership and the rising level of

revenue receipts. It should be noted that during the last two years listed in Table 1 the counties in Florida completed reassessment of real property which resulted in a significant increase in the tax base. It is possible that by the end of the decade, average daily membership (ADM) in Florida schools may reach 1.5 million and that total expenditures may exceed one billion dollars. The implications are apparent. Educators must be able to justify requests for additional allocations of resources, either through increases in student ouput or more efficient utilization of educational media. In other words, it may be necessary to produce more output using the same amount of resources or produce the same output with reduced resources. This is the concept of James et al. (18) had when they defined efficiency as "the maximization of outcomes for a given level of inputs or, alternatively, as the minimization of inputs for given output levels" (18, p. 101).

Taxpayers are becoming increasingly unwilling to approve school budgets that require an increase in taxes. Taylor (36) reports that fifteen counties in Florida in 1967 approved a tax rate lower than that requested by school officials and six counties refused to vote any school levies at all. In recent years Florida school boards have been faced with an increased reluctance on the part of voters to approve requested bond issues. No longer is it possible to have a bond issue pass simply by placing it on the ballot. Citizens are beginning to question the rationale of educators in regard to spending. Legislators

TABLE 1

COMPARISON OF THE PERCENTAGE OF INCREASE IN THE ADM AND REVENUE RECEIPTS OF FLORIDA PUBLIC SCHOOLS, GRADES K-12, BY YEARS

Year	Average Daily Membership	Per Cent of Increase	Total Revenue Receipts (millions of dollars)	Per Cent of Increase
1960-61[a]	979,805	5.7	352.2	7.4
1961-62[b]	1,033,332	5.5	390.7	10.9
1962-63[c]	1,089,482	5.4	427.4	9.4
1963-64[c]	1,140,947	4.7	482.5	12.9
1964-65[d]	1,179,914	3.4	516.2	7.0
1965-66[d]	1,213,504	2.8	640.4	24.1
1966-67[e]	1,262,311	4.0	797.5	24.5

Adapted from Florida State Department of Education [a](10), [b](11), [c](12), and [d](13) and N. E. A. Research Report [e](30).

are becoming hesitant to appropriate ever increasing amounts of financial support. The legislature, in recent session, limited county school systems to a ten mill tax levy for operation of the schools. The news media are becoming increasingly critical of public school expenditures, especially those that have not been arrived at through the use of adequate research and analysis.

A review of the literature has failed to produce a study that has analyzed these problems at the state level in Florida. This study proposed to deal with the "what is" rather than "what ought to be," and was designed to evaluate quantifiable characteristics rather than values or goals of the system, even though these may constitute an area that has tremendous effect on the allocation of available resources. This study utilized a socioeconomic approach centering on the three main determinants of social status--income, education, and occupation--combined with an ecological unit, the county school system, to focus attention on the differences existing between school systems in Florida.

Definition of Terms

Florida Statewide Twelfth Grade Testing Program (TGTP): This is a test designed to provide comparable ability and achievement data for all seniors in the high schools of Florida. It was inaugurated in 1935 by Professor Winston W. Little of the University of Florida and has been sponsored and conducted by the Board of University Examiners since 1940. Constant modifications and revisions have been made. Since 1963, Educational Testing Service of Princeton, New Jersey, has provided special tests for the Florida Program. The test, which is administered annually to all seniors in the high schools of Florida, consists of five separate sections; academic ability, English, social studies, natural science, and mathematics. Raw scores are converted to percentile ranks based upon results for Florida high school seniors.

Educational Output: The numerical value for each of these variables were computed from data supplied by the Board of University Examiners, University of Florida. For the purposes of this study, educational output is defined in terms of county mean scores on the five sub-tests of the Florida Statewide Twelfth Grade Testing Program hereafter referred to as TGTP, and the mean total score earned on this test battery.

$Output_1$ - The mean test score on the English portion of the TGTP.

$Output_2$ - The mean test score on the social studies portion of the TGTP.

$Output_3$ - The mean test score on the natural science portion of the TGTP.

$Output_4$ - The mean test score on the mathematics portion of the TGTP.

$Output_5$ - The mean total score on the TGTP.

$Output_6$ - The mean test score on the aptitude portion of the TGTP.

The aptitude score is used as an output rather than an input variable as this score appears to be more of an achievement measure than a measure of intelligence.

Independent Variables: The independent variables used in this study are the institutional and community characteristics whose relationship to an output of the public educational system will be evaluated. The characteristics were expressed quantitatively. Values assigned each variable were computed from the Superintendent's Biennial Report, published by the Florida State Department of Education, from publications of the U. S. Bureau of the Census, from Florida Education, published by the Florida Education Association, and from information supplied by the Board of University Examiners, University of Florida.

Delimitations

This study is concerned with the relationship between selected socioeconomic and institutional characteristics and student output.

It is limited to characteristics that are quantifiable and does not seek to evaluate goals or values even though these may have an effect on institutional characteristics. It is recognized that no single criterion exists for the assessment of the value of educational outputs. This analysis is limited to the use of scores made by seniors on a standardized test. These data are for one year only. Socioeconomic data were computed using 1960 census data, the most current available. These socioeconomic variables therefore describe the county in which the schools are located rather than the characteristics of the parents of the students. There appears to be no evidence showing that parents of students differ significantly from the general population. Therefore, the measures used were assumed to be representative.

Review of Related Research

While there is little research reported which is directly concerned with the effects of socioeconomic variables and controllable institutional factors as they relate to measures of academic output of high school students in Florida, there is much which has reference to the concepts of this study. Many studies of a similar nature have been conducted in other states, and it is necessary to limit the review of these to those that have the most direct bearing on this study.

In one of the earlier studies done in this field in Florida, McGuire (24) analyzed the relationship between the quality of 45 Florida

secondary schools as measured by three separate criteria and six controllable factors assumed to affect quality. His controllable factors included average salary of teachers, teacher certification, scope of the educational program, school size, quality of administration and condition of plant facilities. He defined quality in terms of a rating on the Evaluation Criteria and Educational Temperatures--1940 Edition, an index of achievement of the students, and holding power of the school. One of the conclusions he reached was:

> The relatively high statistical relationships between each of the three factors of size, scope and salary and student achievement on standardized tests, without making allowances for differences in mental ability as measured by psychological tests, can be interpreted as follows: (1) a true relationship appears to exist between the three factors and student achievement, or (2) the real relationship is between the type of community and the three factors. In view of the high correlation of .88 between the four areas of subject matter and mental ability, and the negligible correlations between the three factors and the index of achievement, it would seem more reasonable to assume that the second interpretation is the more valid one (24, p. 111).

Gentry (15), in a study of Florida school districts, concluded that an index of social climate which included median years of schooling completed by persons 25 years of age and older, per cent change in population, and aggregate income per unit of educational load, could account for only 33 per cent of the variation in effort made to support the educational program.

Florida was one of four states examined by Davis (7) in his analysis of school fiscal policies. He investigated 17 socioeconomic

variables including average daily attendance in public schools, per cent of unemployment in the civilian labor force of the county, median school years completed by persons 25 years old or over, median family income, and population of the school district. He found a weak relationship between socioeconomic factors and local school financial effort. He found an even weaker relationship between these factors and elasticity of demand for education, which he defined as the ratio of percentage change in per capita net effective buying income.

Hopper (17), in a study of socioeconomic factors related to school fiscal policy in Florida, hypothesized: "Socioeconomic factors are associated with local effort and elasticity of demand for education" (17, p. 7). He used 1950 and 1960 data in analyzing 22 socioeconomic variables ranging from population size to per cent of females in the labor force. He concluded:

> Socioeconomic variables leave a large part of the variation in local effort unexplained. Furthermore, in the same state at different points in time, different socioeconomic variables were the best predictors of local effort (17, p. 90).

King (20), in a similar study done in Georgia, had findings that were almost identical to those of Hopper.

Meyer (25), in a follow-up of the study done by Hopper (17), investigated the school systems in 32 counties in Florida having a population of more than 20,000 in the 1960 census. He assumed that high financial effort was a desirable characteristic in that high effort seemed to be related to quality education in a positive way. He found

that systems making a higher effort employed a greater percentage of male teachers, paid higher teachers' salaries, had a lower pupil-teacher ratio, paid higher principals' salaries, and had more regularly scheduled school board meetings.

Shelley (35), in a 1957 study of 39 schools in South Carolina, related 8 controllable factors to 3 measures of quality. His controllable factors were teacher instructional expenditure unit, socio-economic status of the community, size of the school, scope of the educational program, teachers' salaries, certification, administration, and school plant. The selected measures of quality included holding power, Evaluative Criteria rating, and supervisor's rating. He presented the following conclusions based on the 29 white schools in the study (35, pp. 207-210):

1. Sixty-nine per cent of the variance of school quality is accounted for by variation in school size, scope of the educational program, plant facilities, administration, socioeconomic status of the school-community, average teachers' salaries, certification of teachers, and teacher instructional expenditure units; and thirty-one per cent of the variance is accounted for by variables other than these.

2. The two most important factors affecting school quality are: the scope of the educational program and the calibre of the administrative leadership. It would appear then, that the best way to improve the quality of education, would be to focus attention on these two factors first.

3. School size is an important factor that affects school quality, but it is of lesser importance than the scope and the administration.

4. There is little or no relationship between school quality and the socioeconomic status of the school-community in South Carolina.

5. The assumption that a certain amount of training required for certification will improve the quality of teaching is supported. Certification is positively related to school quality at the five per cent level of confidence.

Miner (26), in a study of 21 states using 4 measures of expenditures as dependent variables and 21 independent variables including median family income, salary of beginning teachers, median years of education, and per cent of non-white population, found that fiscally dependent school systems tended to spend less than fiscally independent systems. He made no attempt to correlate spending with quality of output, even though there is ample research evidence to show that the level of educational expenditures is strongly and positively related to quality in education, however quality may be defined (2, 5, 18, 19, 21, 28, 29, 32).

Mort, after an extensive review of research in the area of cost-quality relationship stated:

> These data would seem to indicate that even if the community factors were considered an entirely independent causative factor, which it certainly is not, or if it were denied that the community influence in considerable degree works through expenditures, the relationships that appear in the normative studies between expenditure level and quality would be strong (27, p. 49).

Freeman (14) analyzed several factors which contributed to increased expenditures in the public schools of this country. He found that the major portion of increase in school expenditures was being allocated

for teacher salary raises without regard to measurement of student output.

Clark supports the premise that level of expenditure is correlated with the level of the program: "The evidence suggests that schools which spend more money get a higher quality of education" (5, p. 1). Johns and Morphet have also shown that the quality of the instructional program is strongly related to the financial support of the educational program: "Even in higher-expenditure level school systems, there seems to be a strong relationship between expenditures and quality education" (19, p. 15).

McMahon (23), in an analysis of school expenditures within an area including several states, found that proportion of non-whites, proportion of the population consisting of school age children and proportion of children not attending public schools accounted for 52 per cent of the variations between states.

Hirsch (16) investigated school expenditures from 1900 to 1958 and correlated total current expenditures with high school enrollment as a per cent of total enrollment, average daily attendance as a per cent of 5-to-19-year-old population in urban areas, average annual salary of instructional staff members and the number of principals, superintendents and consultants per 1,000 pupils in average daily attendance. The last variable was the only one designed to measure quality of education. It was found to be not statistically significant.

The editors of School Management, in a comment on research on quality of education conducted over a 10-year period, remarked that

"cost-quality studies over the decade have shown that the best indicator of the quality of the educational program is the level of per pupil cost" (33, p. 182). In a later issue, however, the editors modified their position: "Net current expenditures per pupil is a good, but not a perfect, measure of school quality" (34, p. 146).

Thomas (37) found that differences in the mean levels of achievement in schools in Chicago could be accounted for, in large part, in terms of the student's background, in the abilities and activities of the teachers, and in the technical knowledge of the administrator. In an earlier study he pointed out that the manipulation of fiscal and administrative variables had a predictable effect on the output of the school. He reported that the manner in which the administrator spent money appeared to be more important than the level of expenditure (38).

Barron (1, p. 284) reported a study made by Treadway in over 400 school districts in Arkansas. Treadway examined the influence of 39 measures of school quality. Supervisory services, class size and teacher qualifications were included in a list of 8 variables which, when combined, yielded the highest multiple correlation coefficient. Administrators can exercise some degree of control over each of these factors.

Brazer and David (3), using a multivariate analysis procedure developed by Kempthorne, found a significant correlation between such parental factors as peak earnings, level of education, color and

occupation and the output of students in high school. It is interesting to note that a North-to-South migration was correlated with higher academic success by the children.

One of the earlier attempts to relate community characteristics to the quality of education was done by Pierce (31) in a study of the schools in 48 communities within the metropolitan area of New York City. He found that nearly 64 per cent of the variability in the quality of schools could be predicted from variations among communities with reference to certain measures of community factors. Per cent of college graduates in the district, school population, school tax rate, per pupil expenditure, attendance in non-public schools, per cent of families living in owner-occupied buildings, and trends in postal receipts were among those factors contributing to this difference.

Firman (8), reporting in a study of the relationship of cost to quality in education, discussed the Quality Measurement Project of the New York State Education Department. This was a project that compared schools in regard to selected characteristics in the financial and administrative areas as well as the area of staff characteristics. He reported that the excellent schools were smaller, wealthier, spent more per pupil for instructional purposes, had more professionals per 1,000 pupils, and had younger staffs who had travelled more extensively. However, the poor schools had a slightly higher average teacher salary than did the excellent ones. He warned that quality education will remain undefined until more aspects of it are identified.

The heartening look of current research is that the school administrator, as well as others in leadership positions, can and does exert positive and significant influence on the factors that affect the quality of education in the public schools. There have been some discordant notes sounded, however. Burkhead, in his investigation of test results of students in the high schools in Chicago and Atlanta, relates:

> The most important finding of this study is that variations in educational outcomes in large-city high schools, measured in terms of test scores, are almost wholly conditioned by the socioeconomic environment of the neighborhood. The income class of the neighborhood, housing conditions, occupation of parents, ethnic status--these are the important determinants of variations in educational outcomes (4, p. 88).

Coleman (6) in an extensive research program sponsored by the U. S. Office of Education, found that when socioeconomic factors are controlled, the differences between schools account for only a small portion of the differences in the achievement of the pupils. This conclusion, if it is indeed correct, places the major portion of the variables that determine pupil achievement outside the control of the school administrator. Few socioeconomic variables can be regulated by administrators in the public schools. There has been some severe criticism of this report.

Levin (22) has charged that Coleman misunderstood the statistical technique employed. Multiple regression analysis was used and Levin contends that any overlap in two or more variables is always given the first variable placed in the regression. In Coleman's and Burkhead's

studies, the socioeconomic variable was inserted first. Levin also felt that the measures of school characteristics used by Coleman were not complete enough to be valid.

The question raised by these last two studies should be of concern to every educator. What changes will be necessary in the school program should subsequent research support Coleman's contentions? Until such time as more research in this area is completed, it seems reasonable to expect school administrators to assume they do have an effect on the quality of educational output and to act accordingly in trying to produce a finer product--better educated students.

Organization of the Study

Chapter I includes the following information: (a) Introduction; (b) Statement of the Problem; (c) Need for the Study; (d) Definition of Terms; (e) Delimitations; and (f) Review of Related Research.

Chapter II consists of the procedures used which include: (a) Selection of the Independent Variables; (b) Selection of the Dependent Variables; and (c) Treatment of the Data.

Chapter III describes the analyses made and gives interpretations of the data. It includes findings relevant to both groups of independent variables separately and when they are combined.

Chapter IV summarizes the findings of the study and suggests implications for education as well as recommendations for future studies.

CHAPTER II

PROCEDURES

The purpose of this study was to examine two categories of data as they related to educational output of the public high schools in Florida. The measure of output was the raw data county mean score of the Florida Statewide Twelfth Grade Testing Program. The first category of data examined was a list of selected institutional characteristics--characteristics over which school officials exercise some measure of control. The second category was a set of selected socioeconomic characteristics.

More specifically this study proposed to answer the following questions:

1. Do various institutional characteristics such as student-faculty ratios, size of school centers, per cent of male faculty members, and fiscal variables relate to educational output as measured by scores on the Florida Statewide Twelfth Grade Testing Program?

2. Are selected socioeconomic status variables related to educational output as measured by standardized test results?

3. If relationships can be identified in Steps 1 and 2 above, what is the nature and strength of the relationship?

Selection of the Independent Variables

The independent variables (predictor variables) used were selected through an extensive review of the literature related to this study. Some of the variables were used in a majority of the studies

reviewed, others were used less often. In selecting the variables it was necessary to include those which it was felt would have the most significant effect on the output of Florida's public schools. It is not inferred that these are the only variables affecting outcome. Indeed, it was necessary to limit the selection to a manageable number. Community characteristics were selected for which data were available and quantifiable and which appeared to have some effects on the educational output of the system.

Studies relating these variables to education were reviewed in Chapter 1. Institutional variables were limited to those which studies have shown to have been highly related to outcomes of the school. These studies were also discussed previously.

The following independent variables were selected for inclusion in the study. A brief explanation of how the value of each variable was computed follows the listing of the variable. The symbol for each is in parentheses. These variables do not appear in numerical order as it was necessary to list them in a different sequence for purposes of computer analysis.

Institutional Characteristics

Variable 8 (SE) - Number of seniors taking the TGTP in 1966. This information was furnished by the Board of University Examiners, University of Florida and is on file in their office. It includes only those seniors who completed the examination in October, 1966.

Variable 16 (RT) - Instructional personnel in the county public school system holding a State of Florida

teaching certificate of Rank II or higher. This information includes all instructional personnel in the system having a Rank II or higher teaching certificate (13).

Variable 17 (SS) - Salary for beginning teachers in the county public school system. The starting salary for a teacher holding a Rank III teaching certificate, who has had no previous teaching experience (9).

Variable 18 (ST) - The ratio of students to classroom teachers in the public schools of the county. This value was determined by dividing the number of students in average daily membership by the total number of classroom teachers in the county (13).

Variable 19 (SC) - The ratio of students to guidance counselors in the public schools of the county. This is the ratio of students in average daily membership to full-time equivalent guidance counselors employed in the county (13).

Variable 20 (TW) - The average enrollment of school centers, grades 10-12, of public schools of the county. The total enrollment of grades 10-12 was divided by the number of school centers in the county containing grades 10-12 (13).

Variable 21 (CE) - The total current operating expense minus transportation costs per instructional unit employed. The cost of pupil transportation was subtracted from the total current operating expense of the county. This remainder was divided by the total instructional units employed in the county (13).

Variable 22 (M6) - The ratio of male to female teachers employed in the public schools of the county, grades K-6. This ratio includes only classroom teachers for computational purposes. This ratio was expressed as: one male teacher per x number of female teachers. Lower values therefore mean more male teachers in proportion to female teachers. This is also true in Variable 23 (13).

Variable 23 (M7) - The ratio of male to female teachers employed in the public schools of the county, grades 7-12. The procedure used in variable 22 applies here also (13).

Variable 24 (LE) - The total amount spent for library services per student in ADM in the public schools of the county. This figure represents the total county expenditure exclusive of state funds for library services divided by the total average daily membership of schools in the county (13).

Community Characteristics

The community characteristics selected for study center on three of the main determinants of social status--income, education and occupation. Selection of these variables was made after an extensive review of the literature. The numerical value for the community characteristics included for study was computed from data supplied by the U. S. Department of Commerce (39). Variables selected and the symbol to be used in subsequent references are as follows:

Variable 7 (NW) - Per cent of county population classified as non-white.

Variable 9 (WC) - Per cent of county population employed in white-collar occupations.

Variable 10 (FY) - Per cent of county population who have completed four or more years of college.

Variable 11 (MI) - Median family income in the county.

Variable 12 (10M)- Per cent of population in the county whose annual income is in excess of $10,000.00.

Variable 13 (5Y) - Per cent of county population, 25 years old or over, having completed less than 5 years of school.

Variable 14 (MS) - Median school years completed, persons 25 years old or over, of residents of the county.

Variable 15 (UE) - Per cent of civilian labor force in the county unemployed.

Selection of Dependent Variables

The dependent variables selected for analysis were the five sub-tests of the Florida Statewide Twelfth Grade Testing Program and the total score of the test. The county mean and the standard deviation were computed for each of the county school systems in Florida. The numerical value for each dependent variable is confidential and is therefore excluded from the study. This information is on file at the Board of University Examiners, University of Florida, Gainesville, Florida and will be released only at the discretion of the director of that organization. The variables used in this study were assigned the following numbers and symbols and subsequent listing will refer to the variable by either symbol or number depending on the way in which the analysis was accomplished. The following are the dependent variables used in this study:

Variable Number	Symbol	Description
1	ENG	English sub-test of TGTP
2	SOCST	Social Studies sub-test of TGTP
3	NATSC	Natural Science sub-test of TGTP
4	MATH	Mathematics sub-test of TGTP
5	TOTAL	Total score on TGTP
6	APTD	Aptitude sub-test of TGTP

Treatment of the Data

In those instances where mean values were used, they were computed by county using 1965-1966 Florida public school data (13). Numerical values for these and all other variables were computed or extracted from 1960 census tables (39), and placed on punched cards for computer analysis.

One of the principal statistical procedures employed was stepwise multiple regression correlation. The program used was the EMD02R, version of May 2, 1966, developed by the Health Sciences computing facility, University of California, Los Angeles. The following is a technical description of the program as used in this study:

Problem Code	County
Number of Cases	67
Number of Original Variables	24
Number of Variables Added	0
Total Number of Variables	24
Number of Sub-Problems	18
The Variable Format	(3X, 6F4.2, F3.1, F5.0, 2F3.1, F4.0, F3.1/3X, 2F3.1, F2.1, F3.1, F4.0, F3.1, 2F4.0, F5.0, F3.1, 2F3.2)

Transgeneration Programs 18 and 19 were used to compute beta coefficients.

No variable was forced into the equation out of sequence as was done by Coleman (6) and Burkhead (4) but all variables were entered into the analysis.

Three separate regression analyses were computed for each of the six dependent variables. The first included only those variable defined as Institutional Characteristics, the second only those defined as Community Characteristics. The third allowed both categories of variables to enter at the discretion of the program. A coefficient of multiple correlation was computed each time, providing an index of the effects of each grouping of variables with respect to the separate dependent variable.

The transgeneration programs 18 plus 19 provided beta coefficients for each of the independent variables with each of the individual dependent variables. Beta coefficients are net regression coefficients standardized in terms of standard deviations. The mean for each variable is zero and the standard deviation equals one. This places the net regression coefficients on a comparable basis, making it possible to appraise the relative influence of each independent variable. An increase or decrease of one standard deviation in the independent variable is associated with an increase or decrease of one standard deviation in the dependent variable multiplied by the beta coefficient.

A coefficient of correlation (r) was computed showing the relationship between each of the variables used in the study. A matrix was constructed and appears as Table 2.

CHAPTER III

ANALYSES AND INTERPRETATION OF DATA

The first step in the analysis was the preparation of a correlation matrix including all variables, which is shown in Table 2. The output measures were variables 1 through 6. Variables 7 through 24 included all input variables, socioeconomic as well as institutional. Table 3 provides a list of all independent variables, showing the mean, standard deviation, and the unit in which the variable was expressed.

Median school years of the over twenty-five years age group (MS) shows the highest correlation with all the criterion variables, ranging from +.733 with English scores to +.823 with total scores. Per cent of non-white (NW) and per cent of population with less than 5 years schooling (5Y) were negatively correlated with all six measures of output and were positively correlated with each other .685. The ratios of men to women teachers in grades K-6 (M6) and in grades 7-12 (M7) were also negatively correlated with the criterion variables. It is interesting to note that library expenditures (LE) and the student to counselor ratio (ST) were correlated at 0.000.

A coefficient of multiple correlation, subsequently referred to as the multiple R, is computed at each step in the multiple regression. The multiple coefficient is an index of the relationship of the dependent variable with the independent variables included at each step.

TABLE 2
ZERO ORDER CORRELATION MATRIX
INDEPENDENT AND DEPENDENT VARIABLES

VARIABLE NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	1.000																							
2	0.882	1.000																						
3	0.874	0.940	1.000																					
4	0.831	0.854	0.889	1.000																				
5	0.948	0.967	0.969	0.927	1.000																			
6	0.910	0.922	0.928	0.843	0.948	1.000																		
7	-0.574	-0.671	-0.633	-0.462	-0.621	-0.677	1.000																	
8	0.341	0.438	0.423	0.499	0.438	0.397	-0.183	1.000																
9	0.666	0.780	0.736	0.757	0.768	0.709	-0.671	0.529	1.000															
10	0.572	0.623	0.611	0.667	0.643	0.574	-0.175	0.351	0.808	1.000														
11	0.625	0.712	0.679	0.676	0.704	0.627	-0.307	0.569	0.787	0.702	1.000													
12	0.855	0.705	0.700	0.753	0.732	0.650	-0.229	0.583	0.740	0.744	0.903	1.000												
13	-0.695	-0.838	-0.826	-0.712	-0.806	-0.789	0.685	-0.426	-0.787	-0.556	-0.707	-0.661	1.000											
14	0.733	0.822	0.806	0.790	0.823	0.765	-0.426	0.517	0.920	0.816	0.857	0.854	-0.853	1.000										
15	0.247	0.309	0.217	0.138	0.248	0.230	-0.356	0.146	0.238	0.051	0.155	0.021	-0.325	0.237	1.000									
16	0.070	0.134	0.079	0.134	0.108	0.092	0.023	0.179	0.357	0.417	0.122	0.183	-0.150	0.271	0.040	1.000								
17	0.392	0.422	0.460	0.322	0.416	0.482	-0.363	0.439	0.322	0.209	0.517	0.511	-0.598	0.463	0.116	0.010	1.000							
18	0.261	0.306	0.234	0.242	0.277	0.130	0.036	0.302	0.302	0.327	0.490	0.453	-0.271	0.372	0.200	-0.017	0.164	1.000						
19	-0.034	-0.013	-0.125	-0.102	-0.065	-0.114	0.111	-0.242	-0.016	0.044	0.063	-0.001	-0.028	0.005	0.150	-0.031	-0.067	0.338	1.000					
20	0.511	0.597	0.578	0.615	0.598	0.541	-0.239	0.877	0.668	0.471	0.666	0.685	-0.593	0.694	0.158	0.277	0.445	0.450	-0.137	1.000				
21	0.392	0.321	0.361	0.317	0.367	0.436	-0.356	0.447	0.321	0.171	0.296	0.341	-0.390	0.336	0.094	0.343	0.624	-0.042	-0.263	0.439	1.000			
22	-0.371	-0.388	-0.343	-0.229	-0.358	-0.468	0.426	-0.154	-0.251	-0.081	-0.277	-0.241	0.449	-0.301	-0.238	-0.075	-0.519	-0.033	-0.015	-0.187	-0.408	1.000		
23	-0.216	-0.250	-0.252	-0.118	-0.225	-0.336	0.488	0.037	0.047	0.186	-0.026	-0.019	0.327	-0.052	-0.122	0.243	-0.486	0.104	-0.193	0.015	-0.289	0.462	1.000	
24	0.438	0.379	0.416	0.488	0.448	0.461	-0.152	0.092	0.463	0.366	0.446	0.511	-0.363	0.462	-0.160	0.078	0.320	-0.145	0.000	0.167	0.249	-0.168	0.015	1.000

Values numerically larger than .245 are significant at the .05 level.
Values numerically larger than .318 are significant at the .01 level.

TABLE 3

STATE MEAN AND STANDARD DEVIATION
INDEPENDENT VARIABLES

Variable Number	Symbol	Mean	Standard Deviation	Unit in which expressed
7	NW	21.825	11.312	Per cent
8	SE	1001.239	1878.927	Students
9	WC	35.037	7.574	Per cent
10	FY	6.113	2.695	Per cent
11	MI	3857.015	856.760	Dollars
12	10M	7.478	3.517	Per cent
13	5Y	15.054	7.082	Per cent
14	MS	9.646	1.298	Years
15	UE	4.621	1.413	Per cent
16	RT	24.333	5.267	Per cent
17	SS	4458.880	355.842	Dollars
18	ST	23.813	1.995	Students
19	SC	1152.672	625.541	Students
20	TW	413.522	375.994	Students
21	CE	8396.133	837.189	Dollars
22	M6	11.666	9.196	Teachers
23	M7	1.067	0.339	Teachers
24	LE	2.896	1.269	Dollars

The square of R indicates the proportion of variance in the dependent variable which may be associated with variance of the included independent variables. For the purposes of this study, relationships which are significant at the 0.05 level or above are considered statistically significant.

Relationship of Independent Variables to English Scores

Table 4 shows the relationship of institutional characteristics with English scores on the TGTP. The size of the school (TW), library expenditures (LE), the ratio of men to women teachers (M7), and the number of seniors taking the TGTP contribute nearly 51 per cent of the total variation among counties. All ten variables together are associated with nearly 58 per cent of these differences leaving over 42 per cent of the variation unexplained. The first two variables, (TW) and (LE), were significant at the 0.001 level and the next two entered, (M7) and (SE), were significant at the 0.05 level.

The relationship of socioeconomic factors with English scores are found in Table 5. Median school years of the over twenty-five years old age group (MS) is associated with over 50 per cent of the variability in English scores. When per cent of non-white population (NW) was entered, it added nearly 9 per cent to the total variability. These two variables were both significant at the 0.001 level. The total variability associated with the eight socioeconomic variables was slightly in excess of 66 per cent. This leaves nearly one-third of the variability not associated with variations in community factors.

TABLE 4

INSTITUTIONAL CORRELATES OF ENGLISH SCORES ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	TW 20	0.5105	0.2606	0.2606	22.9130[d]
2	LE 24	0.6398	0.4093	0.1487	16.1130[d]
3	M7 23	0.6796	0.4618	0.0525	6.1470[a]
4	SE 8	0.7109	0.5054	0.0435	5.4547[a]
5	M6 22	0.7228	0.5224	0.0170	2.1757
6	ST 18	0.7297	0.5324	0.0100	1.2869
7	SC 19	0.7400	0.5476	0.0151	1.9740
8	SS 17	0.7505	0.5633	0.0158	2.0929
9	CE 21	0.7550	0.5700	0.0067	0.8868
10	FY 16	0.7599	0.5775	0.0075	0.9916

[a]Significant at .05 level
[d]Significant at .001 level

TABLE 5

COMMUNITY CORRELATES OF
ENGLISH SCORES ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	MS 14	0.7326	0.5367	0.5367	75.2853[d]
2	NW 7	0.7877	0.6205	0.0838	14.1405[d]
3	10M 12	0.8010	0.6415	0.0210	3.6981
4	MI 11	0.8047	0.6476	0.0060	1.0605
5	5Y 13	0.8077	0.6524	0.0048	0.8389
6	WC 9	0.8106	0.6571	0.0048	0.8345
7	UE 15	0.8121	0.6594	0.0023	0.3989
8	FY 10	0.8134	0.6616	0.0022	0.3697

[d]Significant at .001 level

The combined effects of all variables, when inserted into the regression in a step-wise manner, were associated with over 74 per cent of the variations in English scores. Table 6 reveals that only the median school years (MS) and the per cent of non-white (NW) were statistically significant, and they were associated with approximately 62 per cent of the total variability. Library expenditures (LE) entered into the regression at step 4, yet when only institutional characteristics were analyzed, it followed the size of the school (TW) into the equation. This change may be due in part to the relatively high correlation (+0.794) between median school years (MS) and size of the school (TW). In multiple regression correlation when two variables are used that are highly correlated the analysis gives less weight to the second than it does to the first as it enters the equation.

Relationship of Independent Variables to Social Studies Scores

Institutional factors, considered independently, were associated with 61 per cent of the variations in social studies scores on the TGTP. In Table 7, the size of the school (TW) and library expenditures (LE) were significant at the 0.001 level, and proportion of men teachers in grades 7 through 12 (M7) was significant at the 0.005 level. The first three variables alone accounted for over one-half the total variation. The per cent of rank II teachers (RT) appeared to be of little importance in the total variability. This is in contrast to the findings of Thomas (37) and Burkhead (4) who found teacher training an important explanatory variable in regard to test scores.

TABLE 6

THE CORRELATES OF ENGLISH SCORES
ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	MS 14	0.7326	0.5367	0.5367	75.2853[d]
2	NW 7	0.7877	0.6205	0.0838	14.1405[d]
3	10M 12	0.8010	0.6415	0.0210	3.6981
4	LE 24	0.8066	0.6507	0.0091	1.6202
5	ST 18	0.8108	0.6574	0.0067	1.1924
6	MI 11	0.8164	0.6665	0.0091	1.6389
7	5Y 13	0.8202	0.6727	0.0062	1.1115
8	WC 9	0.8254	0.6813	0.0087	1.5786
9	TW 20	0.8291	0.6874	0.0061	1.1129
10	SE 8	0.8365	0.6997	0.0122	2.2819
11	UE 15	0.8406	0.7066	0.0069	1.2929
12	RT 16	0.8435	0.7115	0.0049	0.9257
13	CE 21	0.8481	0.7192	0.0077	1.4498
14	SS 17	0.8537	0.7288	0.0097	1.8511
15	FY 10	0.8572	0.7347	0.0059	1.1333
16	M6 22	0.8615	0.7422	0.0075	1.4478
17	SC 19	0.8616	0.7423	0.0001	0.0174
18	M7 23	0.8616	0.7424	0.0001	0.0222

[d]Significant at .001 level

TABLE 7

INSTITUTIONAL CORRELATES OF
SOCIAL STUDIES SCORES ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	TW 20	0.5972	0.3567	0.3567	36.0346[d]
2	LE 24	0.6759	0.4568	0.1002	11.8028[d]
3	M7 23	0.7253	0.5261	0.0693	9.2058[c]
4	SE 8	0.7436	0.5529	0.0268	3.7179
5	M6 22	0.7540	0.5686	0.0157	2.2186
6	CE 21	0.7614	0.5798	0.0112	1.5975
7	ST 18	0.7661	0.5869	0.0071	1.0176
8	SC 19	0.7726	0.5969	0.0101	1.4468
9	SS 17	0.7799	0.6083	0.0113	1.6507
10	RT 16	0.7813	0.6104	0.0022	0.3101

[c]Significant at .005 level
[d]Significant at .001 level

The per cent of population with less than five years of schooling (5Y) appeared responsible for over 70 per cent of the variance associated with socioeconomic factors. The other seven variables added only 12 per cent more to the total variation, leaving nearly 18 per cent of the variability unexplained. The correlation matrix shows variable 5Y has a negative correlation with social studies scores, and is strongly and positively related to per cent of non-white population (NW). The per cent of white-collar workers in the county (WC), which is strongly related to the number of college graduates, adds nothing to the computed multiple R as shown in Table 8.

The combined socioeconomic and institutional variables, Table 9, account for nearly 85 per cent of the differences among school systems in Florida on the TGTP social studies test. Again, most of the variance was associated with one variable, 5Y. Most of the variation appeared to be socioeconomic in nature although these factors do not completely negate the institutional variables such as starting salary for teachers (SS) and ratio of men to women teachers (M7).

Relationship of Independent Variables to Natural Science Scores

The relationship of institutional variables with natural science scores was similar to that on the social studies scores. The size of the school (TW), library expenditures (LE), and ratio of men to women teachers (M7) were associated with the major portion of the variance. Teacher training (RT) was still an unimportant factor. The average class

TABLE 8

COMMUNITY CORRELATES OF
SOCIAL STUDIES SCORES ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	5Y 13	0.8384	0.7028	0.7028	153.7401[d]
2	MS 14	0.8629	0.7445	0.0417	10.4430[c]
3	NW 7	0.8954	0.8018	0.0573	18.2084[d]
4	10M 12	0.9028	0.8150	0.0132	4.4292[a]
5	UE 15	0.9042	0.8176	0.0025	0.8520
6	FY 10	0.9057	0.8204	0.0028	0.9375
7	MI 11	0.9060	0.8209	0.0005	0.1581
8	WC 9	0.9060	0.8209	0.0000	0.0003

[a]Significant at .05 level
[c]Significant at .005 level
[d]Significant at .001 level

TABLE 9

THE CORRELATES OF SOCIAL STUDIES SCORES ON THE TGTP -

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	5Y 13	0.8384	0.7028	0.7028	153.7401[d]
2	MS 14	0.8629	0.7445	0.0417	10.4430[c]
3	NW 7	0.8954	0.8018	0.0573	18.2084[d]
4	1OM 12	0.9028	0.8150	0.0132	4.4292[a]
5	SS 17	0.9078	0.8241	0.0091	3.1437
6	UE 15	0.9094	0.8270	0.0029	0.9930
7	M7 23	0.9106	0.8293	0.0023	0.8022
8	TW 20	0.9123	0.8324	0.0031	1.0683
9	FY 10	0.9143	0.8359	0.0035	1.2305
10	SE 8	0.9159	0.8389	0.0029	1.0232
11	RT 16	0.9173	0.8414	0.0026	0.8893
12	M6 22	0.9188	0.8441	0.0027	0.9432
13	LE 24	0.9194	0.8453	0.0012	0.4051
14	WC 9	0.9199	0.8461	0.0008	0.2795
15	CE 21	0.9202	0.8468	0.0006	0.2053
16	SC 19	0.9206	0.8475	0.0007	0.2456
17	ST 18	0.9208	0.8480	0.0004	0.1418
18	MI 11	0.9208	0.8480	0.0000	0.0012

[a]Significant at .05 level
[c]Significant at .005 level
[d]Significant at .001 level

size, as measured by the students to teacher ratio (ST), appeared to be of little importance. From Table 10 it can be seen that 61.4 per cent of the variance of natural science scores was associated with institutional factors considered independently. This is virtually the same percentage as was found in the social science scores and is slightly higher than that of English scores.

Socioeconomic determinants of natural science scores are shown in Table 11. These factors acting independently were associated with 78.3 per cent of the variation found in Florida high schools on the natural science portion of the TGTP. The majority of this difference was found in the first three variables. Per cent of population earning in excess of $10,000 (10M) replaced median school years (MS) as the major contributor to this difference. There was a correlation of +.854 between these two factors which indicated a large area of overlap between the two.

The relationships of the two groups of variables is shown in Table 12. The eighteen variables acting jointly were associated with 82.9 per cent of the variation in natural science scores, leaving only 17.1 per cent of the differences unexplained. The socioeconomic variables appeared to make the larger contribution to the total variance, yet when the variation reached 82.17 per cent at the eleventh step, seven of the eleven factors in the equation were institutional variables. Median income of parents, as represented by median income of the county (MI), appeared to be of little value in predicting scores

TABLE 10

INSTITUTIONAL CORRELATES OF
NATURAL SCIENCE SCORES ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	TW 20	0.5785	0.3346	0.3346	32.6889[d]
2	LE 24	0.6794	0.4616	0.1270	15.0969[d]
3	M7 23	0.7294	0.5320	0.0704	9.4793[c]
4	SE 8	0.7470	0.5581	0.0260	3.6524
5	SC 19	0.7620	0.5807	0.0226	3.2933
6	ST 18	0.7732	0.5979	0.0172	2.5660
7	SS 17	0.7786	0.6062	0.0083	1.2503
8	M6 22	0.7823	0.6120	0.0058	0.8655
9	CE 21	0.7834	0.6138	0.0017	0.2546
10	RT 16	0.7836	0.6140	0.0002	0.0302

[c]Significant at .005 level
[d]Significant at .001 level

TABLE 11

COMMUNITY CORRELATES OF
NATURAL SCIENCE SCORES ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	5Y 13	0.8256	0.6817	0.6817	139.1950[d]
2	10M 12	0.8510	0.7242	0.0425	9.8659[c]
3	NW 7	0.8729	0.7620	0.0378	10.0177[c]
4	MS 14	0.8787	0.7722	0.0101	2.7594
5	MI 11	0.8822	0.7784	0.0062	1.7010
6	FY 10	0.8831	0.7799	0.0016	0.4346
7	WC 9	0.8846	0.7826	0.0026	0.7146
8	UE 15	0.8849	0.7830	0.0005	0.1239

[c]Significant at .005 level
[d]Significant at .001 level

TABLE 12

THE CORRELATES OF
NATURAL SCIENCE SCORES ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	5Y 13	0.8256	0.6817	0.6817	139.1950[d]
2	10M 12	0.8510	0.7242	0.0425	9.8659[c]
3	NW 7	0.8729	0.7620	0.0378	10.0177[c]
4	SC 19	0.8793	0.7731	0.0111	3.0292
5	SS 17	0.8866	0.7861	0.0130	3.6946
6	M7 23	0.8904	0.7929	0.0068	1.9681
7	FY 10	0.8948	0.8007	0.0079	2.3281
8	RT 16	0.8989	0.8080	0.0073	2.2091
9	TW 20	0.9010	0.8119	0.0038	1.1620
10	SE 8	0.9050	0.8189	0.0071	2.1857
11	LE 24	0.9065	0.8217	0.0028	0.8612
12	WC 9	0.9082	0.8248	0.0031	0.9435
13	UE 15	0.9092	0.8266	0.0018	0.5593
14	CE 21	0.9100	0.8281	0.0015	0.4493
15	MS 14	0.9103	0.8286	0.0005	0.1553
16	MI 11	0.9104	0.8289	0.0003	0.0778
17	M6 22	0.9105	0.8290	0.0001	0.2920
18	ST 18	0.9105	0.8290	0.0000	0.0031

[c]Significant at .005 level
[d]Significant at .001 level

on the natural science portion of the TGTP. This is in direct contrast to the findings of Coleman (6) and Burkhead (4) who found it to be most significant in their studies.

Relationship of Independent Variables to Mathematics Scores

The size of the school (TW), library expenditures (LE), starting salary for teachers (SS), and students to counselor ratio (SC) had a statistically significant relationship to scores on the mathematics portion of the TGTP, when only institutional variables were considered. The total variation, as shown in Table 13, is 65.1 per cent which leaves approximately 35 per cent of the differences unexplained. Teacher training (RT) again appeared to have little effect on scores made in mathematics. A sizeable increase, 18 per cent, was added to the total variation when library expenditures (LE) enter in step 2. The ratio of men to women teachers (M7) and the ratio of students to teachers (ST) appeared to contribute heavily though neither was statistically significant.

Community variables associated with differences in mathematics scores are listed in Table 14. Median school years (MS) again appeared to be the major contributor although persons earning $10,000 or more (10M), per cent of non-white (NW), and median income (MI) were all statistically significant. The total contribution of all socioeconomic variables is 71.5 per cent, the lowest portion explained by community variables on any test other than English. Per cent of population having

TABLE 13

INSTITUTIONAL CORRELATES OF
MATHEMATICS SCORES ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	TW 20	0.6155	0.3788	0.3788	39.6373[d]
2	LE 24	0.7479	0.5594	0.1806	26.2284[d]
3	M7 23	0.7597	0.5772	0.0178	2.6497
4	SS 17	0.7842	0.6150	0.0379	6.0993[a]
5	ST 18	0.7897	0.6237	0.0086	1.3994
6	SC 19	0.8049	0.6478	0.0241	4.1128[a]
7	M6 22	0.8058	0.6493	0.0014	0.2421
8	SE 8	0.8065	0.6504	0.0012	0.1953
9	CE 21	0.8068	0.6509	0.0005	0.0788
10	RT 16	0.8070	0.6512	0.0003	0.0430

[a]Significant at .05 level
[d]Significant at .001 level

TABLE 14

COMMUNITY CORRELATES OF
MATHEMATICS SCORES ON THE TGTP

Size Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	MS 14	0.7895	0.6234	0.6234	107.5816[d]
2	10M 12	0.8038	0.6461	0.0227	4.1048[a]
3	NW 7	0.8260	0.6822	0.0362	7.1725[b]
4	MI 11	0.8381	0.7024	0.0202	4.2104[a]
5	WC 9	0.8451	0.7142	0.0118	2.5133
6	FY 10	0.8454	0.7147	0.0004	0.0938
7	5Y 13	0.8458	0.7154	0.0007	0.1444
8	UE 15	0.8458	0.7154	0.0000	0.0013

[a]Significant at .05 level
[b]Significant at .01 level
[d]Significant at .001 level

less than five years schooling (5Y), and per cent of population having completed college (FY) appeared to have almost no relationship to mathematics scores. The per cent of population unemployed (UE) appeared to have no effect at all.

The multiple correlation for all variables, both socioeconomic and institutional, is shown in Table 15. Five factors were statistically significant; three were community factors and two were institutional variables. The total explained portion of the differences in mathematics scores is 78.8 per cent, the lowest for all dependent variables except English scores. Median family income (MI), while not significant, appeared to make more of a contribution here than in other sections of this study. Size of the school (TW), library expenditures (LE), and starting salary for teachers (SS) were important institutional contributors. The size of the class (ST) appeared to have little relationship to the output of the school as measured by test scores.

Relationship of Independent Variables to Total Scores

The amount of variation in total score that was associated with variations in institutional factors was 64.6 per cent. As seen in Table 16, the size of the school (TW) and library expenditures (LE) again appeared as the possible major contributors to these differences. The ratio of men to women teachers (M7), the number of seniors (SE), and the students to counselor ratio (SC) were statistically significant even though the latter did not enter the regression until step 8. Teacher training (RT) and current operating expense (CE) appeared to make little or no contribution.

TABLE 15

THE CORRELATES OF
MATHEMATICS SCORES ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	MS 14	0.7895	0.6234	0.6234	107.5816[d]
2	10M 12	0.8038	0.6461	0.0227	4.1048[a]
3	NW 7	0.8260	0.6822	0.0362	7.1725[b]
4	SS 17	0.8403	0.7061	0.0238	5.0290[a]
5	MI 11	0.8494	0.7215	0.0155	3.3854
6	LE 24	0.8557	0.7322	0.0106	2.3803
7	TW 20	0.8689	0.7550	0.0229	5.5065[a]
8	M7 23	0.8746	0.7649	0.0098	2.4240
9	SC 19	0.8782	0.7712	0.0063	1.5781
10	5Y 13	0.8808	0.7757	0.0046	1.1375
11	RT 16	0.8828	0.7793	0.0035	0.8775
12	FY 10	0.8853	0.7837	0.0044	1.1100
13	UE 15	0.8869	0.7866	0.0029	0.7237
14	CE 21	0.8875	0.7877	0.0011	0.2657
15	WC 9	0.8877	0.7880	0.0003	0.0690
16	M6 22	0.8877	0.7881	0.0001	0.0143
17	ST 18	0.8878	0.7881	0.0001	0.0128
18	SE 8	0.8878	0.7881	0.0000	0.0025

[a]Significant at .05 level
[b]Significant at .01 level
[d]Significant at .001 level

TABLE 16

INSTITUTIONAL CORRELATES OF
TOTAL SCORE ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	TW 20	0.5984	0.3580	0.3580	36.2507[d]
2	LE 24	0.7111	0.5057	0.1477	19.1227[d]
3	M7 23	0.7502	0.5629	0.0572	8.2367[b]
4	SE 8	0.7686	0.5907	0.0279	4.2198[a]
5	M6 22	0.7740	0.5991	0.0089	1.2714
6	SS 17	0.7814	0.6106	0.0116	1.7813
7	ST 18	0.7880	0.6210	0.0103	1.6103
8	SC 19	0.8037	0.6459	0.0250	4.0878[a]
9	RT 16	0.8038	0.6461	0.0002	0.0312
10	CE 21	0.8038	0.6461	0.0000	0.0003

[a]Significant at .05 level
[b]Significant at .01 level
[d]Significant at .001 level

The multiple R for community factors was .8931, the highest for any criterion variable other than social studies. Table 17 reveals that median school years (MS), per cent of non-white (NW) and per cent of population earning $10,000 or more (10M) provide the major portion of the differences, which amounts to 79.7 per cent. The first three variables account for all but 1 per cent of the total variation.

The combined effect of all variables, Table 18, was associated with 84.2 per cent of the variation in total scores leaving slightly over 15 per cent unexplained. Here again most of the contribution appeared to have been made by socioeconomic variables rather than institutional factors. The students to teacher ratio (ST) once more seemed to be of little value in predicting outcome on test scores.

The Relationship of Independent Variables to Aptitude Scores

The multiple R of institutional variables on this portion of the TGTP was the largest for any of the six dependent variables which supports the assumption made earlier that the aptitude test was more of an achievement measure than a measure of intelligence. A look at Table 19 shows the size of the school (TW), library expenditures (LE), and the ratios of men to women teachers (M7) contribute the major share of the differences. Approximately 67 per cent of the variation in scores is associated with institutional factors.

The relationship of socioeconomic variables with aptitude scores is shown in Table 20. Again, the first three factors appeared to be

TABLE 17

COMMUNITY CORRELATES OF
TOTAL SCORE ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	MS 14	0.8235	0.6781	0.6781	136.9131[d]
2	NW 7	0.8761	0.7675	0.0895	24.6024[d]
3	1OM 12	0.8883	0.7892	0.0217	6.4810[a]
4	MI 11	0.8915	0.7948	0.0056	1.6926
5	FY 10	0.8922	0.7960	0.0012	0.3621
6	UE 15	0.8927	0.7969	0.0009	0.2746
7	5Y 13	0.8929	0.7974	0.0005	0.1323
8	WC 9	0.8931	0.7976	0.0003	0.0739

[a]Significant at .05 level
[d]Significant at .001 level

TABLE 18

THE CORRELATES OF
TOTAL SCORE ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	MS 14	0.8235	0.6781	0.6781	136.9131[d]
2	NW 7	0.8761	0.7675	0.0894	24.6024[d]
3	IOM 12	0.8883	0.7892	0.0217	6.4810[a]
4	SS 17	0.8916	0.7949	0.0057	1.7278
5	MI 11	0.8940	0.7993	0.0044	1.3300
6	RT 16	0.8967	0.8042	0.0049	1.5032
7	CE 21	0.8990	0.8081	0.0040	1.2206
8	LE 24	0.9003	0.8106	0.0024	0.7448
9	TW 20	0.9036	0.8164	0.0059	1.8245
10	SE 8	0.9070	0.8227	0.0062	1.9681
11	FY 10	0.9089	0.8262	0.0035	1.1049
12	UE 15	0.9111	0.8301	0.0040	1.2595
13	M7 23	0.9127	0.8330	0.0029	0.9188
14	SC 19	0.9143	0.8360	0.0029	0.9313
15	5Y 13	0.9157	0.8384	0.0025	0.7785
16	M6 22	0.9166	0.8401	0.0017	0.5249
17	WC 9	0.9175	0.8417	0.0016	0.5076
18	ST 18	0.9176	0.8420	0.0003	0.0792

[a]Significant at .05 level
[d]Significant at .001 level

TABLE 19

INSTITUTIONAL CORRELATES OF
APTITUDE SCORE ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	TW 20	0.5408	0.2925	0.2925	26.8745[d]
2	LE 24	0.6760	0.4569	0.1644	19.3774[d]
3	M7 23	0.7613	0.5796	0.1227	18.3875[d]
4	M6 22	0.7795	0.6077	0.0280	4.4324[a]
5	SE 8	0.7924	0.6279	0.0202	3.3158
6	SC 19	0.8058	0.6494	0.0215	3.6748
7	SS 17	0.8126	0.6604	0.0110	1.9082
8	ST 18	0.8150	0.6642	0.0038	0.6615
9	RT 16	0.8154	0.6648	0.0006	0.1063
10	CE 21	0.8155	0.6650	0.0002	0.0251

[a]Significant at .05 level
[b]Significant at .001 level

TABLE 20

COMMUNITY CORRELATES OF
APTITUDE SCORE ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	5Y 13	0.7893	0.6230	0.6230	107.4295[d]
2	NW 7	0.8113	0.6582	0.0351	6.5751[a]
3	MS 14	0.8582	0.7364	0.0783	18.7117[d]
4	10M 12	0.8651	0.7483	0.0119	2.9303
5	MI 11	0.8709	0.7585	0.0102	2.5637
6	WC 9	0.8719	0.7602	0.0017	0.4269
7	FY 10	0.8732	0.7625	0.0023	0.5623
8	UE 15	0.8733	0.7627	0.0002	0.0527

[a]Significant at .05 level
[d]Significant at .001 level

associated with the major portion of the differences. The per cent of variance associated with community factors was 76.3 which left nearly one-fourth of the total variance unexplained when socioeconomic variables were considered independently.

Table 21 includes all independent variables associated with variations in aptitude scores. Library expenditures (LE), ratio of men to women teachers (M7), and school size (TW) appeared to be the most important institutional variables. Median family income (MI) once again appeared to have little relationship with total variation.

Relationship of Independent Variables to Dependent Variables Using Beta Coefficients

The analyses using beta coefficients do not change the value of the computed multiple R. The independent variable's effect is shown relative to all other variables in the equation. The beta coefficients of all independent variables with each separate dependent variable are shown in Tables 22 through 27.

The per cent of non-white (NW) appears to be strongly and negatively related to scores on each portion of the TGTP. It is statistically significant on every portion with the exception of mathematics. The size of the school (TW) shows a strong, positive relationship in all cases. It is not statistically significant on the social studies, natural science, or mathematics sections of the test. Library expenditures (LE), as a factor, appears to have a strong positive relationship with output in English, mathematics, total scores, and

TABLE 21

THE CORRELATES OF
APTITUDE SCORE ON THE TGTP

Step Number	Variable Entered	Multiple R	Multiple R^2	Increase in R^2	F Value to Enter or Remove
1	5Y 13	0.7893	0.6230	0.6230	107.4295[d]
2	NW 7	0.8113	0.6582	0.0351	6.5751[a]
3	MS 14	0.8582	0.7364	0.0783	18.7117[d]
4	LE 24	0.8699	0.7568	0.0203	5.1861[a]
5	M7 23	0.8783	0.7714	0.0147	3.9144
6	IW 20	0.8852	0.7836	0.0121	3.3675
7	SC 19	0.8890	0.7903	0.0067	1.8890
8	SE 8	0.8929	0.7972	0.0069	1.9824
9	M6 22	0.8964	0.8035	0.0063	1.8314
10	SS 17	0.8995	0.8091	0.0056	1.6413
11	WC 9	0.9031	0.8156	0.0064	1.9167
12	FY 10	0.9069	0.8224	0.0068	2.0765
13	RT 16	0.9095	0.8272	0.0048	1.4709
14	CE 21	0.9109	0.8298	0.0026	0.7934
15	ST 18	0.9121	0.8319	0.0021	0.6285
16	UE 15	0.9127	0.8331	0.0012	0.3701
17	10M 12	0.9137	0.8349	0.0018	0.5442
18	MI 11	0.9144	0.8361	0.0012	0.3397

[a]Significant at .05 level
[d]Significant at .001 level

TABLE 22
THE CORRELATES OF ENGLISH SCORES ON THE TGTP
BETA COEFFICIENTS

	R_m	MS	NW	10M	LE	ST	MI	5Y	WC	TW	SE	UE	RT	CE	SS	FY	M6	SC	M7
MS	.7326	.7327[d]																	
+NW	.7877	.5964[d]	-.3200[d]																
+10M	.8010	.3279[a]	-.3679[d]	.2910															
+LE	.8066	.3184	-.3660[d]	.2423	.1114														
+ST	.8108	.3046	-.3832[d]	.1738	.1657	.1072													
+MI	.8164	.3727[a]	-.3977[d]	.1786	.1745	.1408	-.2503												
+5Y	.8202	.5241[a]	-.4786[d]	.2962	.1781	.1518	-.2449	.2076											
+WC	.8254	.8161[a]	-.5203[d]	.2144	.2022	.1581	-.1983	.2674	-.2634										
+TW	.8291	.8559[a]	-.5411[d]	.1300	.2527[a]	.1580	-.1874	.3060	-.3362	.1309									
+SE	.8365	.7172[a]	-.5517[d]	.1784	.2438[a]	.1156	-.1324	.3249	-.2942	.3886	-.2630								
+UE	.8406	.6251	-.5280[d]	.2651	.2578[a]	.0885	-.1514	.3290	-.2735	.4338[a]	-.3078	.1022							
+RT	.8435	.5884	-.5012[d]	.3037	.2422[a]	.0659	-.1942	.3285	-.1892	.4714[a]	-.3374	.1099	-.0853						
+CE	.8481	.5802	-.4554[d]	.3000	.2081	.0764	-.2013	.3391	-.1137	.4421[a]	-.3735[a]	.1076	-.1317	.1203					
+SS	.8537	.5985	-.4413[c]	.2856	.2346[a]	.0846	-.1344	.2159	-.2482	.4021[a]	-.3311	.1040	-.1421	.2008	-.1813				
+FY	.8572	.4177	-.4337[c]	.2695	.1917	.0451	-.1101	.1530	-.2898	.4949[a]	-.3722	.1194	-.1911	.2230	-.1752	.2018			
+M6	.8615	.3998	-.4154[c]	.2637	.1872	.0409	-.1144	.1630	-.2953	.5177[a]	-.3685	.1094	-.2073	.2137	-.2147	.2370	-.1103		
+SC	.8616	.3954	-.4131[c]	.2626	.1897	.0460	-.1123	.1587	-.2946	.5171[a]	-.3719	.1112	-.2056	.2113	-.2145	.2359	-.1109	-.0117	
+M7	.8616	.3954	-.4059[b]	.2577	.1953	.0517	-.1076	.1605	-.2899	.5149[a]	-.3691	.1128	-.2006	.2086	-.2213	.2337	-.1078	-.0191	-.0189

[a]Significant at .05 level
[b]Significant at .01 level
[c]Significant at .005 level
[d]Significant at .001 level

TABLE 23
THE CORRELATES OF SOCIAL STUDIES SCORES ON THE TGTP
BETA COEFFICIENTS

	R_m	5Y	MS	NW	1CM	SS	UE	M7	TW	FY	SE	RT	M6	LE	WC	CE	SC	ST	MI
5Y	.8384	-.8382[d]																	
+MS	.8629	-.5044[d]	.3913[c]																
+NW	.8954	-.0782	.6012[d]	-.3610[d]															
+1CM	.9028	-.1023	.3709[a]	-.3896[d]	.2313[a]														
+SS	.9078	-.2238	.2610	-.3814[d]	.3128[b]	-.1293													
+UE	.9094	-.2195	.2263	-.3706[d]	.3477[b]	-.1316	.0604												
+M7	.9106	-.2001	.2597	-.3468[d]	.3511[b]	-.1609[a]	.0625	-.0655											
+TW	.9123	-.1900	.2386	-.3498[d]	.3263[a]	-.1755[a]	.0575	-.0779	.0820										
+FY	.9143	-.2281	.0941	-.3469[d]	.3084[a]	-.1679[a]	.0672	-.0938	.1083	.1270									
+SE	.9159	-.2043	.0493	-.3637[d]	.3313[a]	-.1473	.0768	-.0833	.2293	.1378	-.1271								
+RT	.9173	-.2057	.0286	-.3631[d]	.3058[a]	-.1391	.0789	-.0739	.2670	.1831	-.1443	-.0608							
+M6	.9188	-.2035	.0116	-.3552[d]	.2995[a]	-.1599	.0724	-.0593	.2810	.2004	-.1463	-.0738	-.0676						
+LE	.9194	-.1986	.0104	-.3514[d]	.2860[a]	-.1727	.0824	-.0676	.3074	.1796	-.1512	-.0700	-.0643	.0490					
+WC	.9199	-.2011	.0853	-.3688[d]	.2681	-.1870	.0817	-.0610	.3125	.1933	-.1366	-.0636	-.0666	.0603	-.0999				
+CE	.9202	-.1834	.0968	-.3815[d]	.2649	-.1673	.0810	-.0638	.3179	.1818	-.1297	-.0469	-.0681	.0691	-.1016	-.0402			
+SC	.9206	-.1955	.0671	-.3641[c]	.2772	-.1694	.0913	-.810	.3263	.1861	-.1453	-.0444	-.0672	.0704	-.0853	-.0501	-.0341		
+ST	.9208	-.1897	.0965	-.3663[c]	.2544	-.1765	.0868	-.0927	.3036	.1681	-.1286	-.0318	-.0649	.0905	-.0909	-.0519	-.0467	.0366	
+MI	.9208	-.1893	.0971	-.3664[c]	.2580	-.1755	.0869	-.0922	.3029	.1676	-.1282	-.0323	-.0651	.0902	-.0889	-.0522	-.0464	.0369	-.0058

[a]Significant at .05 level
[b]Significant at .01 level
[c]Significant at .005 level
[d]Significant at .001 level

TABLE 24
THE CORRELATES OF NATURAL SCIENCE SCORES ON THE TGTP
BETA COEFFICIENTS

	R_m	5Y	10M	NW	SC	SS	M7	FY	RT	TW	SE	LE	WC	UE	CE	MS	MI	M6	ST
5Y	.8256	-.8255[d]																	
+10M	.8510	-.6441[d]	.2745[c]																
+NW	.8729	-.3676[c]	.3902[d]	-.2922[c]															
+SC	.8793	-.4050[c]	.3732[d]	-.2585[b]	-.1077														
+SS	.8866	-.4704[d]	.4039[d]	-.2577[b]	-.1193	-.1443													
+M7	.8904	-.4916[d]	.4353[d]	-.1989	-.1537[a]	-.2111[a]	-.1179												
+FY	.8948	-.4416[d]	.3403[c]	-.2009[a]	-.1632[a]	-.1820[a]	-.1508	.1507											
+RT	.8989	-.4507[d]	.3049[b]	-.1946	-.1653[a]	-.1692	-.1323	.2080	-.0981										
+TW	.9010	-.4103[c]	.2479[a]	-.2040[a]	-.1544[a]	-.1731	-.1441	.2364[a]	-.1166	.0959									
+SE	.9050	-.3499[a]	.2546[a]	-.2271[a]	-.1687[a]	-.1412	-.1329	.2410[a]	-.1292	.2780	-.1955								
+LE	.9065	-.3473[a]	.2278	-.2241[a]	-.1662[a]	-.1619	-.1424	.2099	-.1242	.3164[a]	-.1986	.0729							
+WC	.9082	-.4087[b]	.2287	-.2524[a]	-.1610[a]	-.1867	-.1264	.2708[a]	-.1165	.3485[a]	-.1857	.0900	-.1620						
+UE	.9092	-.3928[a]	.2431	-.2409[a]	-.1736[a]	-.1932	-.1359	.2718[a]	-.1155	.3640[a]	-.2011	.1059	-.1753	.0514					
+CE	.9100	-.4130[a]	.2417	-.2278[a]	-.1626[a]	-.2229[a]	-.1256	.2869[a]	-.1414	.3523[a]	-.2054	.0924	-.1812	.0486	.0638				
+MS	.9103	-.3747[a]	.2113	-.2418[a]	-.1565[a]	-.2237[a]	-.1223	.2649	-.1354	.3360[a]	-.1867	.0972	-.2250	.0409	.0622	.1161			
+MI	.9104	-.3725	.2427	-.2424[a]	-.1523[a]	-.2146	-.1175	.2622	-.1404	.3322	-.1847	.0936	-.2072	.0425	.0603	.1184	-.0475		
+M6	.9105	-.3717	.2422	-.2417[a]	-.1519[a]	-.2180	-.1141	.2659	-.1428	.3343	-.1844	.0929	-.2089	.0410	.0596	.1173	-.0491	-.0132	
+ST	.9105	-.3727	.2452	-.2414[a]	-.1500	-.2170	-.1124	.2688	-.1446	.3380	-.1871	.0897	-.2084	.0417	.0599	.1125	-.0481	-.0135	-.0058

[a]Significant at .05 level
[b]Significant at .01 level
[c]Significant at .005 level
[d]Significant at .001 level

TABLE 25
THE CORRELATES OF MATHEMATICS SCORES ON THE TGTP
BETA COEFFICIENTS

	R_m	MS	1CM	NW	SS	MI	LE	TW	M7	SC	5Y	RT	FY	UE	CE	WC	M6	ST	SE
MS	.7895	.7494[d]																	
+1CM	.8038	.5421[d]	.2894[a]																
+NW	.8260	.3556[a]	.3986[b]	-.2193[b]															
+SS	.8403	.3269[a]	.5067[d]	-.2752[c]	-.1885														
+MI	.8494	.4204[b]	.7016[d]	-.2810[c]	-.1699[a]	-.3163													
+LE	.8557	.4028[a]	.6409[d]	-.2813[d]	-.1806[a]	-.2948	.1208												
+TW	.8689	.2872	.5424[c]	-.2948[d]	-.2195[b]	-.2923	.2078[a]	.2443[a]											
+M7	.8746	.2995	.5114[b]	-.2333[b]	-.2989	-.2553	.2343[b]	.2818[a]	-.1319										
+SC	.8782	.3194[a]	.4821[b]	-.1975[a]	-.3276[c]	-.2027	.2340[b]	.2626[a]	-.1859	-.0908									
+5Y	.8808	.1647	.5148[b]	-.1318	-.3663[d]	-.1970	.2358[b]	.2540[a]	-.1804	-.1062	-.2033								
+RT	.8828	.2129	.5157[b]	-.1348	-.3569[c]	-.2375	.2355[b]	.2689[a]	-.1593	-.0985	-.1906	-.0676							
+FY	.8853	.0640	.4904[b]	-.1307	-.3410[c]	-.2387	.2098[a]	.2925[a]	-.1699	-.1052	-.2369	-.0979	.1587						
+UE	.8869	.0135	.5284[b]	-.1092	-.3513[c]	-.2507	.2265[a]	.2949[b]	-.1824	-.1200	-.2447	-.0985	.1713	.0659					
+CE	.8875	.0052	.5258[b]	-.0960	-.3771[c]	-.2459	.2144[a]	.2807[a]	-.1749	-.1111	-.2653	-.1203	.1844	.0631	.0545				
+WC	.8877	-.0338	.5454[a]	-.0844	-.3688[c]	-.2614	.2068[a]	.2692[a]	-.1786	-.1121	-.2655	-.1248	.1758	.0640	.0530	.0609			
+M6	.8877	-.0328	.5457[a]	-.0849	-.3662[b]	-.2602	.2074[a]	.2673[a]	-.1812	-.1124	-.2661	-.1230	.1729	.0651	.0536	.0621	.0102		
+ST	.8878	-.0265	.5405[a]	-.0856	-.3675[b]	-.2622	.2140	.2646[a]	-.1849	-.1172	-.2635	-.1155	.1673	.0643	.0531	.0629	.0109	.0124	
+SE	.8878	-.0198	.5382[a]	-.0859	-.3689[b]	-.2630	.2150	.2563	-.1854	-.1169	-.2640	-.1182	.1655	.0632	.0526	.0602	.0110	.0142	.0087

[a]Signficant at .05 level
[b]Significant at .01 level
[c]Significant at .005 level
[d]Significant at .001 level

TABLE 26
THE CORRELATES OF TOTAL SCORES ON THE TGTP
BETA COEFFICIENTS

	R_m	MS	NW	10M	SS	MI	RT	CE	LE	TW	SE	FY	UE	M7	SC	M6	WC	ST
MS	.8235	.8234[d]																
+NW	.8760	.6827[d]	-.3304[d]															
+10M	.8883	.4097[c]	-.3789[d]	.2954[a]														
+SS	.8916	.3957[c]	-.4063[d]	.3483[b]	-.0923													
+MI	.8940	.4455[d]	-.4094[d]	.4520[b]	-.0824	-.1683												
+RT	.8967	.5014[d]	-.3951[d]	.4547[c]	-.0857	-.2033	-.0761											
+CE	.8990	.5186[d]	-.3736[d]	.4314[b]	-.1413	-.1851	-.1108	.0935										
+LE	.9003	.5075[d]	-.3754[d]	.4034[a]	-.1433	-.1748	-.1066	.0883	.0580									
+TW	.9036	.4505[c]	-.3875[d]	.3589[a]	-.1448	-.1870	-.1097	.0544	.1059	.1313								
+SE	.9070	.3824[a]	-.3901[d]	.3711[a]	-.1439	-.1605	-.1181	.0693	.1136	.3048	-.1804							
+FY	.9089	.2780	-.4015[d]	.3454[a]	-.1231	-.1620	-.1530	.0840	.0880	.3446[a]	-.2037	.1396						
+UE	.9111	.2149	-.3890[d]	.3958[a]	-.1242	-.1851	-.1574[a]	.0851	.1072	.3735[a]	-.2277	.1542	.0757					
+M7	.9127	.2124	-.3573[d]	.3777	-.1650	-.1628	-.1445	.0808	.1202	.3751[a]	-.2084	.1634	.0780	-.0787				
+SC	.9143	.1882	-.3345[d]	.3710[a]	-.1734	-.1269	-.1335	.0603	.1286	.3981[a]	-.2390	.1717	.0963	-.1147	-.0679			
+SY	.9157	.0528	-.2826[b]	.3898[a]	-.2073	-.1212	-.1404	.0760	.1225	.3820[a]	-.2296	.2005	.0973	-.1123	-.0771			
+M6	.9166	.0434	-.2787[b]	.3903[a]	-.2198	-.1292	-.1504	.0729	.1186	.3903[a]	-.2292	.2148	.0913	-.0990	-.0756	-.0534		
+WC	.9175	.1487	-.3059[b]	.3407	-.2440[a]	-.0945	-.1382	.0754	.1362	.3979[a]	-.2073	.2332	.0868	-.0899	-.0704	-.0558	-.1493	
+ST	.9176	.1717	-.3076[b]	.3264	-.2485[a]	-.0997	-.1291	.0738	.1513	.3799[a]	-.1942	.2191	.0834	-.0984	-.0797	-.0541	-.1517	.0283

[a]Significant at the .05 level
[b]Significant at the .01 level
[c]Significant at the .005 level
[d]Significant at the .001 level

TABLE 27
THE CORRELATES OF APTITUDE SCORES ON THE TGTP
BETA COEFFICIENTS

	R_m	5Y	NW	MS	LE	M7	TW	SC	SE	M6	SS	WC	FY	RT	CE	ST	UE	10M	MI
5Y	.7893	.7891[d]																	
+NW	.8113	.6132[d]	-.2570[a]																
+MS	.8532	.0101	-.4327[d]	.5897[d]															
+LE	.8699	-.0055	-.4354[d]	.5007[d]	.1612[a]														
+M7	.8783	-.0964	-.3909[d]	.5984[d]	.1620[a]	-.1486													
+TW	.8852	.1235	-.4103[d]	.4779[c]	.2072[b]	-.1575[a]	.1643												
+SC	.8890	.0959	-.3694[d]	.4950[c]	.1991[b]	-.1843[a]	.1349	-.0896											
+SE	.8929	.1187	-.3793[d]	.4665[c]	.2158[c]	-.1880[a]	.3265	-.1076	-.1881										
+M6	.8964	.1488	-.3761[d]	.4683[c]	.2097[b]	-.1536	.3343[a]	-.1030	-.1969	-.0965									
+SS	.8995	.0789	-.3365[c]	.4414[b]	.2353[c]	-.2050[a]	.3346[a]	-.1188	-.1599	-.1202	-.1227								
+WC	.9031	.0798	-.3917[d]	.6375[c]	.2635[c]	-.1738	.3445[a]	-.1051	-.1263	-.1278	-.1658	-.2573							
+FY	.9069	.0185	-.4027[d]	.4731[a]	.2373[b]	-.1827[a]	.3809[a]	-.1133	-.1350	-.1396	-.1636	-.3224	.1881						
+RT	.9095	.0104	-.3909[d]	.3836	.2193[b]	-.1697	.4245[a]	-.1180	-.1692	-.1569[a]	-.1530	-.2687	.2467	-.0859					
+CE	.9109	-.0197	-.3716[c]	.3725	.2023[a]	-.1577	.4118[a]	-.1048	-.1774	-.1539[a]	-.1913	-.2724	.2689	-.1204	.0844				
+ST	.9121	-.0219	-.3702[c]	.3612	.1667	-.1319	.4594[a]	-.0750	-.2003	-.1602[a]	-.1724	-.2776	.3107[a]	-.1482	.0880	-.0730			
+UE	.9127	-.0190	-.3569[c]	.3376	.1803	-.1409	.4828[a]	-.0852	-.2165	-.1552[a]	-.1705	-.2781	.3238[a]	-.1502	.0854	-.0762	.0427		
+10M	.9137	-.0453	-.3509[c]	.2114	.1518	-.1360	.4922[a]	-.0838	-.2504	-.1541[a]	-.1757	-.2364	.3231[a]	-.1539	.0875	-.1051	.0596	.1203	
+MI	.9144	-.0395	-.3525[c]	.2213	.1477	-.1274	.4804[a]	-.0773	-.2432	-.1561[a]	-.1586	-.2003	.3150[a]	-.1627	.0831	-.0985	.0619	.1820	-.1000

[a]Significant at the .05 level
[b]Significant at the .01 level
[c]Significant at the .005 level
[d]Significant at the .001 level

aptitude. Per cent of persons earning $10,000 or more (10M) appears to be a strong and positive indicator of output of all sections of the TGTP. The percent of persons having attended college (FY) is statistically significant on the aptitude score and is strongly and positively related to outcome on all the other sections. Median family income (MI), which Burkhead (4) found to be the best predictor of outcome on test scores, appears to have little relationship with scores made on the TGTP. The size of the class (ST) still appears to have very little relationship to output.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Purpose of the Study

The purpose of this study was to examine the relationship of selected socioeconomic and institutional characteristics to educational output as measured by county mean scores on a standardized test. The study was designed to evaluate quantifiable characteristics rather than values or goals of the system, even though the latter may affect the allocation of resources within the system.

Selection of Variables

The dependent variables selected for analysis were the five subtests of the Florida Statewide Twelfth Grade Testing Program (TGTP), and the total score of the test. Information was obtained from tests taken by seniors in all public high schools in Florida during October of 1966, the latest data available when this study was begun. All sixty-seven county school systems, containing a total of 67,080 seniors, were included in the analysis.

Two categories of independent variables were selected. The first category was a list of selected institutional characteristics--characteristics over which school officials exercise some measure of control. These variables were selected after an extensive review of the literature related to the study. It was necessary to limit the selection of

variables in this category to a manageable number. No inference is made that these are the only variables that affect educational output. Ten institutional variables were selected. They were: number of seniors taking the TCTP in 1966; per cent of instructional personnel having a Rank II, or higher, teaching certificate; salary for beginning teachers; the ratio of students to classroom teachers; the ratio of students to guidance counselors; the enrollment of the school center; the current operating expense minus transportation costs per instructional unit in the county; the ratio of male to female teachers grades K - 6; the ratio of male to female teachers grades 7 - 12, and the amount spent per student for library services. In those instances where mean values were used, they were computed by county using 1965-66 Florida public school data (13).

The second category of independent variables selected was a set of socioeconomic characteristics. These variables were limited to those for which data were available and quantifiable. Here again it is not inferred that these are the only socioeconomic factors that affect educational outputs. These community factors included: per cent of non-white population; per cent of population employed in white collar occupations; per cent of county population having completed four years of college; median family income in the county; per cent of population earning in excess of $10,000; per cent of county population 25 years old or over, having completed less than 5 years of school; median school years completed by county residents, and per cent of

civilian labor force in the county unemployed. Data related to socio-economic factors were taken from the 1960 census reports. These variables describe the county in which the schools were located. These measures were assumed to be representative as no evidence was found showing that parents of students differ significantly from the general population.

Statistical Procedure

The principal statistical procedure employed was stepwise multiple regression and multiple correlation. The computer program used was the BMDOR2, version of May 2, 1966, developed by the Health Sciences computing facility, University of California, Los Angeles.

Levin (22) claims that Coleman (6) in his study, which this study replicates in parts, forced variables into the regression analyses out of sequence and prejudiced the results by adding weight to the first variables entered into the equation. In this study no variable was forced into the equation as was done both by Coleman (6) and Burkhead (4). All variables were allowed to enter the analysis at the discretion of the computer which selected the variable entering according to the F value at each step in the analysis.

In an attempt to further compare the results, three separate regression analyses were computed for each of the six dependent variables. The first included only those variables defined as Institutional Characteristics, the second only those defined as Community Characteristics. The third allowed both categories of variables to enter at the discretion

of the program. The association with the dependent variable of each set of independent variables, as well as the combined effects of the two groups, could then be analyzed independently. A coefficient of multiple correlation, the multiple R, was computed at each step in the analysis providing an index of the association of each grouping of variables with respect to the dependent variable. This multiple R, when squared, provided the percentage of variation in the dependent variable associated with the independent variables.

Conclusions

This study proposed to answer the following questions:

1. Do various institutional characteristics such as student-faculty ratios, size of school centers, per cent of male faculty members, and fiscal variables relate to educational output as measured by scores on the Florida Statewide Twelfth Grade Testing Program?
2. Are selected socioeconomic status variables related to educational output as measured by standardized test results?
3. If relationships can be identified in Steps 1 and 2 above, what is the nature and strength of the relationship?

The Relationships of Independent Variables to English Scores on the TGTP

1. The following are the relationships of independent variables to English scores on the TGTP, when institutional variables and community variables were analyzed separately:

   A. Institutional variables found to be significantly related to English scores were: the size of the school, library expenditures, the ratio of men to women teachers grades 7-12, and the number of seniors taking the TGTP. In the step-wise multiple regression analysis these four factors

had a multiple R of 0.7109. When all ten institutional factors were included the multiple R was 0.7599.

B. Community factors related to English scores at the 0.05 level or greater included median school years and per cent non-white population. These two factors had a multiple R of 0.7877, and all eight community factors combined had a multiple R of 0.8134.

2. The relationships to English scores on the TGTP, of all independent variables when institutional factors and community factors were analyzed together, were as follows:

A. Median school years and per cent non-white population were the only two variables found to be statistically significant. Both of these are community characteristics. The multiple R for these two factors was 0.7877.

B. The multiple R for all eighteen independent variables combined was 0.8616. The square of the multiple R was 0.7424, which means approximately 75 per cent of the variation in English scores was associated with the eighteen independent variables.

The community variables considered separately had a multiple R of 0.8134 whereas the multiple R for institutional factors was only 0.7599. This appears to show community factors having a stronger relationship with English scores than institutional factors. The multiple regression technique has a tendency to understate the value of those factors entering the regression after the initial entry is made, and it is difficult to ascertain how much overlap between variables has occurred. Still, the addition of institutional characteristics to the community factors increases the total of the accounted for variability in scores by 8 percentage points.

The Relationships of Independent Variables to Social Studies Scores on the TGTP

1. The following relationships between social studies scores on the TGTP and institutional characteristics and community factors considered separately were found:

   A. The size of the school, library expenditures, and the ratio of men to women teachers in grades 7-12 are the institutional characteristics that were found to be statistically significant. These three factors had a multiple R of 0.7253 and all institutional factors together had a multiple R of 0.7813.

   B. Community factors related to social studies scores at the 0.05 level of significance or beyond include: per cent of persons having less than five years schooling, median school years of county residents, per cent of non-white population, and per cent of persons having an income in excess of $10,000. These four factors made a multiple R of 0.9028 and the addition of the other four community characteristics increased this to 0.9060.

2. The relationships of all independent variables considered together to social studies scores on the TGTP were as follows:

   A. There were no statistically significant institutional characteristics when all eighteen independent variables were analyzed together.

   B. Community factors found to be significantly related to social studies scores included persons having less than five years schooling, median school years of county residents, per cent of non-white population, and per cent of persons having an income in excess of $10,000. These four variables have a multiple R of 0.9028. This means that nearly 85 per cent of the variation in county scores on the social studies portion was associated with the independent variables used in this study.

Here again it appears that the community factors have a stronger relationship to scores on the TGTP than institutional factors. The two variables associated with the greater portion of the variance in scores were per cent of persons having less than five years of schooling and median school years completed by persons in the county. Both of these characteristics are highly related to output of the schools. The amount of variability associated with institutional factors considered separately is 61 per cent compared to 82 per cent for community characteristics, and 85 per cent for all independent variables considered together.

The Relationships of Independent Variables to Natural Science Scores on the TGTP

1. The following relationships between natural science scores on the TGTP and institutional characteristics and community factors considered separately were found:

   A. The size of the school, library expenditures and the ratio of men to women teachers grades 7-12 were all significantly related to natural science scores at the 0.005 level or beyond. These three factors combined had a multiple R of 0.7294. The multiple R for all institutional variables was 0.7836.

   B. Community factors found to be significantly related to natural science scores were persons having less than five years schooling, per cent of persons having an income in excess of $10,000, and per cent of nonwhite population. The multiple R for all community characteristics was 0.8849. The three variables mentioned above were responsible for the major portion of this total, 0.8729.

2. The relationships of all independent variables to natural science scores when all variables were considered together were:

   A. No institutional characteristics were significant at the 0.05 level or beyond.

   B. Community characteristics found to be significantly related to natural science scores were persons having less than five years schooling, per cent of persons having an income in excess of $10,000, and per cent of non-white population. All variables combined had a multiple R of 0.9105.

The total explained portion of the variability in natural science scores was 83 per cent. Institutional factors alone were associated with 61 per cent and community factors analyzed independently were associated with 78 per cent. The step-wise regression analysis again makes no provision for overlap in the variables. The major portion, 0.6817, of the total multiple R was associated with persons having less than five years of schooling. This characteristic is strongly and negatively related to all six of the dependent variables.

The Relationships of Independent Variables to Mathematics Scores on the TGTP

1. The relationships of institutional characteristics and community factors to mathematics scores on the TGTP were:

   A. In the step-wise regression analysis of institutional characteristics, four factors were found to be significantly related to scores on the TGTP. They included the size of the school, library expenditures, starting salary for teachers, and the students to guidance counselor ratio. Two other variables entered the equation before students to guidance counselor ratio did, but neither was related at the

0.05 level or beyond. They were the ratio of men to women teachers in grades 7-12 and the students to teacher ratio. After all six of these variables had entered the equation the multiple R was 0.8049, and this was raised to 0.8070 when all ten institutional variables were included.

B. Median school years, per cent of persons earning in excess of $10,000, per cent of non-white population, and median family income were community characteristics significantly related to mathematics scores. These four variables alone had a multiple R of 0.8381 out of the total multiple R of 0.8458 when all community variables were entered. This was the only time median family income showed a statistically significant relationship to educational output as measured by test scores. This contrasts quite vividly with the findings of Burkhead (4) who found this variable to be the most important determinant of test scores.

2. All independent variables considered together, related to mathematics scores as follows:

A. Starting salary for teachers, and the size of the school were related at the 0.05 level. Library expenditures entered the regression before size of the school but was not statistically significant.

B. Median school years, per cent of persons earning in excess of $10,000 and per cent of non-white population were related to mathematics scores at the 0.05 level or beyond. Median school years alone was associated with over 62 per cent of the variation in scores.

The multiple R for all eighteen variables was 0.8878. This value square is 0.7881, meaning more than 78 per cent of the variability in scores was associated with the factors in this study. Institutional characteristics alone were associated with over 65 per cent of the variability and community characteristics were associated with nearly 72 per cent. If all institutional characteristics had been forced into

the equation first, as was done by Coleman (6) and Burkhead (4), the addition of community characteristics into the regression equation would have increased the amount of accounted for variability by only 13 per cent. Conversely only 6 per cent of the variability in scores would have been accounted for by the addition of institutional factors if community factors had been forced in first.

The Relationships of Independent Variables to Total Scores on the TGTP

1. The relationships of institutional factors and community characteristics, considered separately, to total scores on the TGTP were:

   A. The size of the school, library expenditures, ratio of men to women teachers grades 7-12, number of seniors taking the test, and the students to guidance counselor ratio were significant at the 0.05 level or beyond. Once again students to guidance counselor ratio enters the regression after three other variables that were not significantly related. These three characteristics were ratio of men to women teachers grades K-6, starting salary for teachers, and students to classroom teacher ratio. The multiple R for all ten independent variables was 0.8038.

   B. Community characteristics showing a significant relationship to total scores were median school years, per cent of non-white population, and persons earning in excess of $10,000. These three factors had a multiple R of 0.8883, with the multiple R for all community factors being 0.8931.

2. The relationships of all independent variables considered together to total scores on the TGTP were:

   A. No institutional variables were significantly related to total scores.

   B. Community characteristics related at the 0.05 level or beyond were median school years, per cent of non-white

population, and persons earning in excess of $10,000. The multiple R for these three factors was 0.8883 and for all eighteen variables was 0.9176. Nearly 85 per cent of the total variability was associated with factors in the study leaving only 15 per cent of the total variability unexplained.

The community factors appear to be responsible for the major portion of the variance in total scores. This is not unexpected when the unusually high simple correlations between total scores and each of the other dependent variables are considered. These correlations range from +0.927 with mathematics scores to +0.969 with natural science scores. In each of the four test scores analyzed thus far, community factors appeared to provide the major share of the variability.

The Relationships of Independent Variables to Aptitude Scores on the TGTP

1. The following relationships between aptitude scores on the TGTP and institutional characteristics and community variables considered separately were found:

   A. The size of the school, library expenditures, the ratio of men to women teachers grades 7-12, and the ratio of men to women teachers K-6 were significant at the 0.05 level or beyond. The multiple R for these four factors was 0.7795 and for all ten institutional variables was 0.8155, the highest for institutional characteristics for any of the dependent variables.

   B. Community characteristics significantly related to aptitude scores were persons having less than five years of schooling, per cent of non-white population, and median school years. A multiple R of 0.8582 was associated with these three factors. When all eight community factors were included the multiple R was 0.8733.

2. The relationships of all independent variables considered together to aptitude scores on the TGTP were as follows:

   A. Library expenditures were related to aptitude scores at the 0.05 level. No other institutional factor was found to be statistically significant.

   B. Community factors related at the 0.05 level or beyond were persons having less than five years of schooling, per cent of non-white population, and median school years. The multiple R for all eighteen variables was 0.9144 which accounts for nearly 84 per cent of the variation in scores.

The multiple R for institutional variables on this portion of the TGTP was the largest for any of the six dependent variables, which might indicate this test may be more of a measure of achievement than intelligence. Community factors again are associated with the major portion of the variance in test scores although institutional variables tend to relate more to aptitude scores than to scores on any other portion of the test.

Implications of the Study

The findings of this study suggest the following implications:

1. The institutional characteristic which accounts for the greatest percentage of the variance in the criteria; i.e., the characteristic which first enters the regression equation in each of the six analyses, is the size of the school. There is a positive correlation between school size and educational output as measured by the TGTP. Consolidation of smaller schools, perhaps even across county lines, might offer students a more diversified program and opportunity to secure more educational benefits.

2. Library expenditures are positively and significantly related to test score results on all six sections of the TGTP, even though the amount spent per child is relatively small. These expenditures include not only library books but all audio-visual material. Educators may be able to raise the level of educational output rather inexpensively if they were willing to allocate additional funds for purchases in this area. Another approach may be the development of programs designed to help teachers become more adept in the use of library materials.

3. The ratio of men to women teachers in grades 7-12 is significant on every section of the TGTP except mathematics. This seems to indicate the need for more men in the teaching profession especially in high school positions. The level of teaching salary has risen to a point where it now appears possible to develop interest among male college students in a teaching career.

4. The per cent of non-white population is strongly and negatively correlated with test results in all areas of the TGTP. The State of Florida should take a more active role in providing services to help non-white citizens derive greater benefits from the educational system. Schools should take the leadership in the development of programs designed to aid all ethnic groups in developing those literary skills necessary for full participation in our society.

5. The per cent of persons having less than five years schooling is strongly and negatively associated with social studies, natural

science, and aptitude scores on the TGTP. Community programs, especially those aimed at helping adults gain basic learning skills, should be greatly increased. Emphasis should be placed on educating the younger parents whose children are now in or will be entering school soon. This does not mean that only parents should be encouraged to return to school. If resources are available, all interested persons should be given the opportunity to further their education.

6. Median school years of the population is strongly and positively related to educational output as measured by the TGTP. The extension of the community college into all areas of Florida should raise the level of schooling throughout the state. More state aid in the way of fellowships and grants should be made available to students capable of performing university work. Extension courses from state universities, night classes for persons unable to attend scheduled day classes, and more comprehensive adult education programs should be offered. High school counselors should make certain those students who want to and are capable of attending college are provided with information that will lighten the task of securing a college education.

This study has examined the relationship between selected institutional and socioeconomic characteristics and output of the county school systems in Florida as measured by standardized test results. The major portion of the variance in test scores was explained by the studied factors. The weight of the evidence, while not

overwhelming, tends to support the hypothesis that socioeconomic factors are more strongly related to test scores than are institutional factors. However, socioeconomic factors can be affected by institutional factors. For example, improved school programs can increase the educational level of the population. It is recommended that further studies of a similar nature be conducted. If areas can be found that have comparable socioeconomic backgrounds but different institutional characteristics, it would be possible to evaluate the effectiveness of the school, as community factors would be held fairly constant. It may be necessary to cross state lines in attempting such an analysis.

Additional studies might be directed towards analyzing the relationship between size of the schools in rural versus urban areas and educational outcome to determine whether size is more important than urbanization. The factor of library expenditures should be examined to determine if this is really a measure of expenditure or a measure of the administrator's philosophy of education. If having more men teachers in the high schools produce better test results, and this appears to be true, the question as to why should be investigated.

BIBLIOGRAPHY

1. Barron, William E. "Measurement of Educational Productivity," in Theory and Practice of School Finance. Edited by Warren E. Gauerke and Jack R. Childress. Chicago: Rand McNally and Company, 1967.

2. Bothwell, Bruce K. Creative Expenditures for Quality Education. New York: Associated Public School Systems, 1958.

3. Brazer, Harvey E. and Martin David. "Social and Economic Determinants of the Demand for Education," in Economics of Higher Education. Edited by Selma J. Muskin. Washington: Government Printing Office, 1962.

4. Burkhead, Jesse. Input and Output in Large-City High Schools. Syracuse: Syracuse University Press, 1967.

5. Clark, Harold F. Cost and Quality in Public Education. Syracuse: Syracuse University Press, 1963.

6. Coleman, James S., et al. Equality of Education Opportunity. U. S. Office of Education. Washington: Government Printing Office, 1966.

7. Davis, Julian M. "Relationship of Selected Socioeconomic Factors to School Fiscal Policy." Unpublished Ed. D. dissertation, University of Florida, 1967.

8. Firman, William D. "The Relationship of Cost to Quality Education," in Long Range Planning in School Finance. Washington: National Education Association, 1963.

9. Florida Education. "Unofficial Summary Classroom Teacher Salary Range, 1965-66." 43, No. 3, 30-32, November, 1965.

10. Florida State Department of Education. Superintendent's Biennial Report, 1958-1960. Tallahassee: State Department of Education, 1961.

11. _____. Superintendent's Biennial Report, 1960-1962. Tallahassee: The Department, 1963.

12. _____. Superintendent's Biennial Report, 1962-1964. Tallahassee: The Department, 1965.

13. _____. Superintendent's Biennial Report, 1964-1966. Tallahassee: The Department, 1967.

14. Freeman, Roger A. School Needs in the Decade Ahead. Washington: Institute for Social Science Research, 1958.

15. Gentry, Gilbert L. "The Relationship of Certain Cultural Factors to Education in Florida." Unpublished Ed. D. dissertation, University of Florida, 1959.

16. Hirsch, Werner Z. Analysis of the Rising Costs of Public Education. Study Paper Number 4, Study of Employment, Growth and Price Levels. Washington: Government Printing Office, 1959.

17. Hopper, Harold H. "Socioeconomic Factors Associated with Patterns of School Fiscal Policy in Florida." Unpublished Ed. D. dissertation, University of Florida, 1965.

18. James, H. Thomas, et al. Wealth, Expenditure and Decision-Making for Education. Stanford: School of Education, Stanford University, 1963.

19. Johns, R. L. and Edgar L. Morphet. Financing the Public Schools. Englewood Cliffs: Prentice-Hall, Inc., 1960.

20. King, Charles Robert. "Socioeconomic Factors Associated with Patterns of School Fiscal Policy in Georgia." Unpublished Ed. D. dissertation, University of Florida, 1965.

21. Kowitz, Gerald T. and William C. Sayres. Size, Cost and Educational Opportunity in Secondary Schools. Albany: New York State Education Department, 1959.

22. Levin, Henry M. "The Coleman Report: What Difference Do Schools Make?" Saturday Review, 51, No. 3:57-58+, January 20, 1968.

23. McMahon, Walter W. "The Determinants of Public Expenditure: An Econometric Analysis of the Demand for Public Education." Unpublished paper. Urbana: Department of Economics, University of Illinois, 1958.

24. McGuire, Vincent. "An Analysis of the Relationship Between Six Controllable Factors and Three Measures of Quality in Forty-Five Florida Secondary Schools." Unpublished Ed. D. dissertation, University of Florida, 1951.

25. Meyer, Henry A. "Characteristics of Selected Florida School Systems in Relation to High and Low Financial Effort." Unpublished Ed. D. dissertation, University of Florida, 1966.

26. Miner, Jerry. Social and Economic Factors in Spending for Public Education. Syracuse: Syracuse University Press, 1963.

27. Mort, Paul T. "Cost-Quality Relationship in Education," in Problems and Issues in Public School Finance. Edited by R. L. Johns and Edgar L. Morphet. New York: Bureau of Publications, Teachers College, Columbia University, 1952.

28. Mort, Paul T. and Orlando F. Furno. Theory and Synthesis of a Sequential Simplex: A Model for Assessing the Effectiveness of Administrative Policies. New York: Institute of Administrative Research, Teachers College, Columbia University, 1960.

29. Musgrave, Richard A. The Theory of Public Finance: A Study in Public Economy. New York: McGraw-Hill, 1959.

30. National Education Association. Estimates of School Statistics, 1967-68. Research Report. Washington: The Association, 1968.

31. Pierce, Truman Mitchell. Controllable Community Characteristics Related to the Quality of Education. New York: Bureau of Publications, Teachers College, Columbia University, 1947.

32. Ross, Donald H. (ed.). Administration for Adaptability. New York: Metropolitan School Study Council, Teachers College, Columbia University, 1958.

33. School Management. "Cost of Education Index." 6:182, January, 1962.

34. _____. "Is Yours a Quality District?" 9:146, January, 1965.

35. Shelley, Herman Walker. "An Analysis of the Relationships Between Eight Factors and Three Measures of Quality in Thirty-Nine South Carolina Secondary Schools." Unpublished Ed. D. dissertation, University of Florida, 1957.

36. Taylor, George. "Tough Taxpayer Attitude is Hurting Schools." Gainesville Sun, Gainesville, Florida, May 1, 1968.

37. Thomas, J. Alan. "Administrative Rationality and the Productivity of School Systems." Chicago: The University of Chicago, Midwest Administration Center, 1964. (Mimeographed.)

38. _____. "Efficiency in Education: An Empirical Study." Administrators' Notebook, 11, No. 2, October, 1962.

39. U. S. Bureau of the Census. U. S. Census of Population: 1960 Volume 1, Characteristics of the Population. Part II, Florida. U. S. Government Printing Office, Washington, D. C., 1963.

40. U. S. Department of Commerce. Statistical Abstract of the United States, 1967. Bureau of the Census. Washington: Government Printing Office, 1967.

BIOGRAPHICAL SKETCH

Richard Marvin Moore was born June 16, 1929, in Clearwater, Florida. He was graduated from Clearwater High School in 1947, after which he served two years in the United States Army. He received the Bachelor of Science degree in Physical Education from the University of Florida in February, 1953. He was recalled to active duty with the Field Artillery, serving until released in 1954. He returned to the University of Florida and received the Master of Education degree in June of 1955.

From August, 1955, until August, 1966, he was employed by the Pinellas County Board of Public Instruction. He served as teacher and administrator in Pinellas County until he returned to work on his doctorate in Educational Administration at the University of Florida in September, 1966.

Richard Marvin Moore is married to the former Leila Ruth Coburn and has three children: Shari, Ricky, and David. He is a major in the Army Reserve and is a member of Phi Delta Kappa Professional Education Fraternity.

This dissertation was prepared under the direction of the candidate's supervisory committee and has been approved by all members of that committee. It was submitted to the Dean of the College of Education and to the Graduate Council, and was approved as partial fulfillment of the requirements for the degree of Doctor of Education.

August 1968

B Stuart Hunsaker by MC Baker
Dean, College of Education

Dean, Graduate School

Supervisory Committee:

Chairman